Framing texts and images of Latin America's official, online climate change news' articles

Reconstrucción de textos e imágenes sobre cambio climático en noticias oficiales de América Latina

Reconstrução de textos e imagens sobre as alterações climáticas em notícias oficiais da América Latina

Fátima Viteri Mancero

Universidad San Francisco de Quito

fviteri@usfq.edu.ec

María Gabriela Pérez

Universidad San Francisco de Quito

mperez@usfq.edu.ec

Sofía Serrano

Universidad San Francisco de Quito

sofiserrano26@hotmail.com

Resumen

The purpose of this study is to reconstruct educational frames in texts and images of official, online climate change news' articles in Latin America, which have remained largely unexplored. Qualitative content analysis of regional news in 2014 was applied to reconstruct educational frames found in texts (14) and images (35). Findings showed mainly educational frames aimed at cognitive processes such as knowledge acquisition and comprehension. Articles presented in a hypertextual environment may have implications for readers' learning. Further study is required for comparative purposes.

Keywords: Climate change; Online; News; Frames; Latin America; Content analysis.

Resumen

El propósito del presente estudio es de reconstruir encuadres educativos, altamente inexplorados, de los textos e imágenes de las noticias oficiales en línea sobre cambio climático en América Latina, enfocado en lo que los lectores puedan aprender de ellos. Para el efecto, se aplicó un análisis cualitativo de contenido a textos (14) e imágenes (35) en las noticias regionales de 2014. Los resultados generales demuestran que los procesos cognitivos incluyen adquisición de conocimientos y comprensión. Los artículos presentados en un entorno virtual tienen implicaciones en el aprendizaje de los lectores. Se recomienda realizar estudios comparativos.

Palabras clave: Cambio climático; En línea; Noticias; Encuadres; América Latina; Análisis contenido

Resumo

O objetivo deste estudo é reconstruir enquadramentos educativos, altamente inexplorados, dos textos e imagens das notícias oficiais on-line sobre a mudança climática na América Latina, enfocado naquilo que os leitores podem aprender a traves deles. Para este fim, uma análise qualitativa do conteúdo dos textos (14) e imagens (35) foi feita no noticiário regional de 2014. Os resultados globais mostram que os processos cognitivos incluem a aquisição de conhecimento e entendimento. Os artigos apresentados em um ambiente virtual tem implicações de aprendizagem para os leitores. Recomenda-se realizar estudos comparativos.

Palavras-chave: Mudança Climática; Em linha; Notícias; Enquadramentos; América Latina; Análise de conteúdo

Introduction

As global concerns of anthropogenic climate change (CC) are largely debated in international conferences (e.g., annual Conferences of Parties), contextualized CC action plans to mitigate and adapt are forwarded to regional and national levels who in turn quickly disseminate the latest CC news through their own websites. For instance, in Latin American and the Caribbean (LAC), which constitutes the third growing internet consumer in the world (Internet World Stats, 2016), regional bodies like Food and Agricultural Organization of the United Nations (FAO) LAC's office communicates about their mitigation of CC effects to ensure food security (http://www.fao.org/americas/en/) while the Economic Commission for Latin America and the Caribbean (ECLAC) communicates about regional social and economic CC effects (http://www.cepal.org/en). The complex and interdisciplinary character of CC is not easy to convey. It has already been argued the risks and dangers of who the news developers are and how they may render a complex issue, a simple and short one for instance (Boykoff, 2011; Boykoff & Boykoff, 2007; Smith, 2005). When news developers are high level, official regional organizations formed by member states or governments (e.g., ECLAC), these are consequently regarded as first hand sources of trustworthy information (e.g., Arcila-Calderón, Mercado, Piñuel-Raigada, & Suárez-Sucre, 2015). Therefore, the importance that news releases garner is not only on the complexity to elaborate CC news with its integral dimension, but also on the responsibility of news developers as official shapers of meaning for their readers, journalists, news agencies in this rather space, internet.

Indeed, online CC news' studies have demonstrated educational purposes and effects in the audience. Those formative purposes certainly play an implicit role in readers' meaning making too. Schäfer (2012) points out that climate scientists and NGOs purposes to use online communication is to: educate the public and change behavior, to name a few. Looking further afield, it's common to find studies that show the 'potential improvement in audiences' knowledge, awareness, perceptions, understanding, engagement with news stories' frames (Zhao et al., 2014; Price, Tewksbury, & Powers, 1997). It is however not always the case. Instead of improving the readers' knowledge or concern, CC messages may rather hinder, bring discontent or critique, or not attain its informational objectives depending on how CC news are framed. Hibberd and Nguyen (2013) show that young undergraduate students (18-26 years-old) from two universities in the United Kingdom and environmental professionals (journalists and experts) considered there is a lack of positive messages. Most are conflicting messages that also focus on the extreme, to name a few. In addition, young students complained that given that news media is an important source of CC information, coverage of CC is either poor or ineffective. The role of news media in framing CC effectively is therefore important to learning from information.

Varia   Vol. 21, No. 2_97   Abril-junio 2017   ISSN: 1605-4806   728-745 pp.

730

Framing climate change

The diversity of CC framing research has mainly been based on framing theory, which emerged as an alternative approach that studies "ideology in the news" in order to "expose hidden assumptions" (Tankard, Jr., 2001, pg. 96) or the reconstruction of for instance, cultural, social, educational representations implicit in texts and images. In her overview of research on CC media framing, Anderson (2009) highlights how media reporting frames climate change with respect to, for instance heavy influences from socio-political or industry interests (p. 178), from an episodic approach or reporting catastrophic events (e.g., floods). She (2009) therefore demonstrates the need for more cross-cultural research from also diverse media outlets like digital media.

In addition, a number of CC studies have mainly focused on frames in thought (Schuldt & Roh, 2014) or effects of media frames in readers' meaning making. Frames in communication research are nevertheless steadily increasing (e.g., Schuldt & Roh, 2014; Shrestha, Burningham, & Grant, 2014; h, 2011) with basically local studies of media frames. For instance, Takahashi (2011) reconstructs through content analyses frames encountered in newspapers in Peru. Schlichting (2013) meta-analytical study of frames by industry actors' CC communications gathers a number of American and European countries. CC frames in communication with a regional perspective are yet largely unexplored in scholarly circles.

CC Framing research in Latin America

CC communications research in the LAC region has timidly increased with studies mainly focused on newspapers (or print media), comparative approach (e.g., Dotson, Jacobson, Kaid, & Carlton, 2012; Gavirati, 2013; Peña Moya, de Frutos García, & Díaz Estévez, 2013; Schäfer & Schlichting, 2014; Zamith, Pinto, & Villar, 2012), or local level research (e.g., Takahashi & Meisner, 2012; Takahashi, 2011; Takahashi, 2013; Mercado, 2013; Soares Veiga, 2013). For instance, Dotson, Jacobson, Kaid and Carlton (2012) led an interesting comparative, content analysis study between leading liberal and conservative newspapers in Chile. The study considered 1628 CC articles published in 2003, 2005 and 2007. Main outcomes show the liberal paper published twice more, twice long and included four times more illustrations than the conservative one. However, both papers mainly framed CC as a conflictive, problematic issue. Both papers mainly used government sources of information and reflected dominant international discourses. Similar results found Takahashi and Meisner (2012) in 459 CC news articles published during the past decade (2000-2010) in Peruvian newspapers. Discourse mainly from industrialized countries dominated texts and sources where basically governmental. Additionally, main emerged frames where effects (as problematic effects) on ecology and little on human or economic effects. Regional or contextualized CC information is rather scarcely communicated despite the fact that there are regional organizations with

established agendas for the socio-economic effects, for instance, of climate change like the Economic Commission for Latin America and the Caribbean (ECLAC). Web portals from these organizations serve as means for broad diffusion. However, few studies have observed general uses of information and communication technologies (ICTs) or online media for CC information (e.g., Eakin et al., 2015; Soares Veiga, 2013) have been published. LAC's online CC framing research remains largely unexplored despite the growing use of Internet as a means for news consumption.

Methods

As follows, detailed information on the methodological implications of the study:

Research question and study design

The present rather focuses, as an initial exploratory effort, the content of texts with its images from the web portals of all official, regional organizations involved in the CC arena. In this regards, the study lays out an inferential research question with a rather qualitative content analysis character:

What educational and integral frames may be reconstructed from regional, official, online climate change news articles?

This research constitutes the first of a series of follow-up studies with growing scopes and comparative approaches.

Materials for analysis

Online CC news articles from January 1 to December 31, 2014 were systematically searched in official, regional web portals (e.g., *www.cepal.org/en/)*. Subsequently, filter criteria were applied to distinguish CC news articles that focused only on regional information or at least a group of three Latin American countries. Finally, 14 out of 38 articles were selected for analysis. Selected articles corresponded to six bodies (see Table 1).

Thirty-five images embedded in selected news articles were used for analysis.

Coding Procedures

Trial and iterative coding cycles were applied to obtain different framing levels, however in search for all those textual and visual elements that demonstrates frames for educational or integral purposes (or structural coding). During the trial phase, texts were divided into coding units–sentences, phrases or paragraphs–that contained an organizing or main idea. Subsequently, this data-driven or descriptive coding (Saldaña, 2013) permitted to infer frames in an organized, logical order and levels: a) emerging main

categories and subcategories; b) emerging subthemes; and c) emerging general theme (or main frame). Given the reverse and inferential procedure of the coding cycle (Saldaña, 2013), it follows a specific to general order. This means first emerging codes (or micro frames) were specific and descriptive. After analysis (or second and third coding cycles) more general codes (or meso, macro frames) were inferred. Figures 1 and 2 shown under the Results Section show a rather general to specific organization, for practical purposes.

Reliability and validity

Three coders (two independent and one dependent) applied coding procedures separately. Percentage of agreement among the three coders was 98.2% (Krippendorfs' alpha produced α=.98) for textual analysis and 99,1% (α=.99 for visual analysis) for visual analysis, considered as high reliability.

Face validity (Schreier, 2012) ensured that there was enough differentiation (or moderate face validity) of main categories and subcategories, in both texts and images, from a conceptual point of view (e.g., factual information is effectively comprised by facts), in spite of few codes that overlapped subcategories (e.g., REPRESENTATIVES or EXAMPLES). It is important to note that given the rhetoric character of the study and the coding procedures, it is indeed possible that there were codes that fell into two categories like EXAMPLES that help to better comprehension (or explanatory information) of the reader and at the same time they might constitute factual information.

Results

As follows, Table 1 with a the regional organizations that produced contextualized CC news articles:

Table 1. **List of LAC's official CC organizations and number of produced CC online news in 2014, (*N*=6)**

	Acronym	Articles	%
Economic Commission of Latin America and the Caribbean	ECLAC	6	42,9
Food and Agriculture Organization (regional office)	FAO	4	28,6
World Meteorological Organization	WMO	1	7,1
United Nations Industrial Development Organization (regional office)	UNIDO	1	7,1
Center of Information of the United Nations	CINU	1	7,1
World Food Programme	WFP	1	7,1

After filtering criteria was applied (see Material for analysis), only six organizations out of 30 bodies

inspected produced contextualized CC news articles for the region. The resting 24 organizations either did not possess an agenda on CC or indirectly included it in their projects, but with a general, global focus.

Textual analysis

Emerging frames were ordered by themes, subthemes, main categories and its codes (see Figure 1) during the third coding cycle for texts and images, respectively.
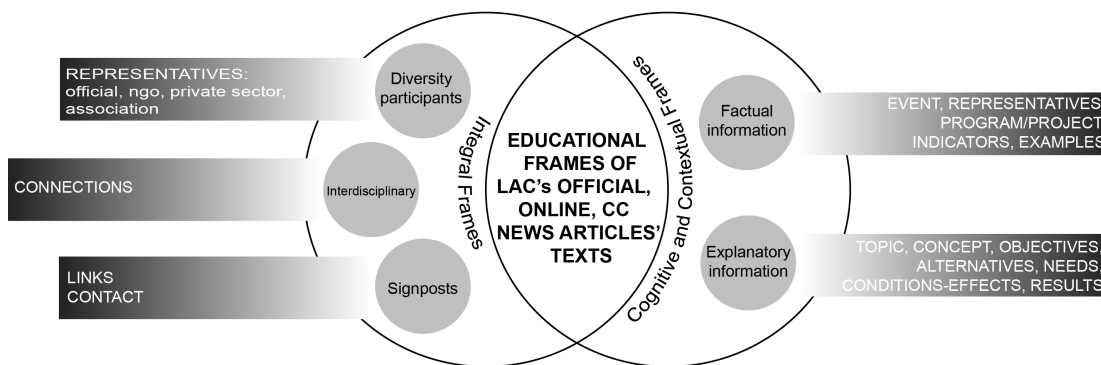

Figure 1. Macro, meso and micro frames for regional online climate change news articles' texts. Macro frames are the main theme in the intersection of both major circles and the subthemes: Cognitives and Contextual Frames and Integral Frames. Meso frames are main categories placed in the five circles with a gray fill. Micro frames are all codes placed in a rectangular label.

Under the major theme established "Educational Frames of LAC's online, official CC News Articles' Texts", two subthemes (or macro frames) emerged: (1) Cognitive and Contextual Information and (2) Integral Information. The following subsections will show results per subtheme and category.

Subtheme 1. Cognitive and contextual information

This subtheme (or macro frame) was constructed after close observation of similarities/differences and/or conceptual patterns from the newly established categories. Hence, the subtheme title and concept was determined once categories were re-structured during the third cycle coding (see Coding Procedures) for better working, generic concepts that ultimately aim to answer the research question. Cognitive and contextual information elaborates around the notions of knowledge acquisition–an initial learning level, according to Marzano and Kendall (2007, 2008) – based on a set of referential input and structured narrative (or storyline).

Category 1. Factual information

The factual information meso frame referred to all straight forward, supporting information like the use of indicators, titles, places, names of representatives, institutions, organizers or countries, dates, deadlines, concrete examples, funding information. Codes (or micro frames) used to describe such facts were EVENT, REPRESENTATIVES, PROGRAM or PROJECT, INDICATORS and EXAMPLES. Each code could have a supplementary subcode in parenthesis to describe more concretely the kind of information for analysis. For example: EVENT (title), EVENT (place), REPRESENTATIVE (name and institution).

Category 2. Explanatory information

The second category (or meso frame) was named Explanatory Information as it implies text that promotes cognitive understanding or, in simple words, comprehension. According to (Marzano & Kendall, 2007, 2008), this implies a following level to the knowledge-based dimension of thought in the field of education.

Codes (or micro frames) reflecting this category were TOPIC, CONCEPT, OBJECTIVES, ALTERNATIVES, NEEDS, CONDITIONS, EFFECTS, RESULTS, EXAMPLES, INDICATORS, CONTRAST, DISCOURSE, CONCLUSIONS, and RECOMMENDATIONS. Both EXAMPLES and INDICATORS overlap categories 1 and 2 given that, in spite of providing factual information, they served a complementary function by supporting arguments for higher comprehension. As in factual information, all codes included subcodes for more detailed information and/or clear interpretation for coding purposes, for example: NEEDS (requirements), OBJECTIVES (aims, goals), DISCOURSE (comment, opinion, testimony). It was indeed possible to apply simultaneous coding or more than one code for a coding unit whenever necessary.

The CC CONDITIONS-EFFECTS micro frames and events or program's OBJECTIVES emerged more frequently in text narratives as opposed to CONCLUSIONS and CONTRASTS.

Subtheme 2. Integral information

Integral information emerged as a subtheme (or macro frame) that gathered meso and micro frames that reflected diversity (e.g., a congregation of countries, ethnics, disciplines) and connections (e.g., deforestation is related economic activity, loss of biodeveristy, and so forth) of any issue within the text. Under this macro frame, REPRESENTATIVES diversity and CONNECTIONS to other topics, processes, reports or institution's subsections were found as the dominant frames. Note that REPRESENTATIVES have been subcoded according to the nature of the institution

participants represented like official, ngo, private sector, association, and network alliance. This was possible given the availability of participant and institutions' names within the texts. In this regard, REPRESENTATIVES do not overlap the one used under subtheme 1.

Category 1. Diversity of event participants

As texts included detailed information of participants, spokespersons and institutions during events, it was possible to observe the diversity of the nature of represented regional bodies' and their spokespersons. All texts highlighted the work of mainly high level, executive official representatives (from international/regional bodies and government) by reproducing their names, titles and discourses and little presence in texts were other participants (ngos, associations, network alliance and private sector).

Category 2. Interdisciplinary representation

The category (or meso frame) Interdisciplinary representation emerged after close observations of structural code CONNECTIONS with all its subcodes. Connections referred to all narratives that reflected relations of CC to other topics and processes like energy, water, use of soil, urbanization, transport, industrial and economic activity, mobility, among others. Such connections permit to capture the dimension and integral nature of CC.

Category 3. Signposts to further information

This frame include all LINKS (or hypertexts) and CONTACT information that served as signposts to readers to seek further information in mainly social media, event websites and less in reports, maps, projects. These tools allow connectedness beyond the news articles to navigate through supporting documents, reports, statistics, agreements, infographies and emails, for instance. LINKS and CONTACT were located within texts and do not overlap or counteract with other codes.

Visual analysis

Thirty-five images that were either embedded within the text or part of a photo gallery linked to news articles were analyzed based on the same structural coding used with textual analysis. However, given the simplicity and high frequency of the same type of images, a lower number of structural codes could be applied. Emerging themes, subthemes, and categories (see Figure 2) slightly differ from the ones presented under Figure 1.
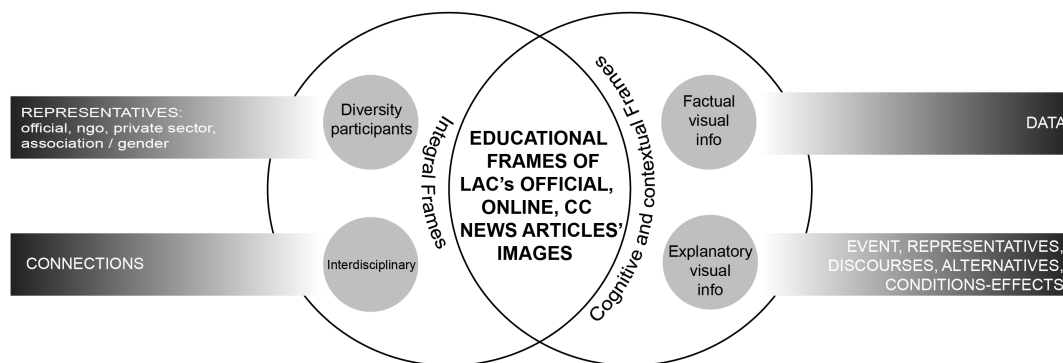
Figure 2. Macro, meso and micro frames for LAC's online climate change news articles' images. Macro frames correspond to the main theme between both circles and the two subthemes Cognitive and contextual frames and Integral Frames. Meso frames are main categories included in the four gray filled circles. Micro frames correspond to all codes presented in the rectangular labels.

Subtheme 1. Cognitive and contextual information

This subtheme (or macro frame) is applied to the collection of all visual elements that promote knowledge acquisition and further comprehension of images. More detail is below provided under the following two categories:

Category 1. Factual visual information

Facts like titles, indicators, names in labels, and logos comprised visual information under this category (or meso frame). Code (or micro frame) used to identify all these elements was DATA.

Category 2. Explanatory visual information

All elements that contributed, not separately or individually but the ensemble of them, to further comprehension of the topic fell under this category (or meso frame). Therefore, observation of compositions mainly showed EVENTS with its REPRESENTATIVES either in a presentation or podium, pronouncing DISCOURSES. Other example was a composition of elements that showed CONDITIONS-EFFECTS of CC in context like a factory polluting with carbon dioxide the atmosphere. There were images that illustrated the ALTERNATIVES or possible solutions to CC like reforestation or crop diversity.

Subtheme 2. Integral frames

This subtheme (or macro frame) was in response to all images that clearly demonstrated connections between its elements and/or promoted further inferences. As follows, its respective two categories:

Varia   Vol. 21, No. 2_97   Abril-junio 2017   ISSN: 1605-4806   728-745 pp.

737

Category 1. Diversity of event participants

While under *Textual Analysis* official representatives' names and titles were described in texts, images rather visualized such key actors emphasizing their protagonists' roles. This was possible to verify, as in a number of images their names and titles were presented in a label over the desks or a brief description was provided underneath each image. This allowed determining the origin of their representation. In this regards, four representatives classifications from government and civil society were possible to identify: official, private sector, association, NGO.

Category 2. Interdisciplinary representations

This category (or meso frame) included all visual elements that together (not alone) reflected connections between topics or had an interdisciplinary character to illustrate climate change. Code (or micro frame) used to define these images was CONNECTIONS. Images that fell under this frame could show CC as a problem (e.g., industrial logging, plagues in plants), solutions (e.g., promotion of agrobiodiversity), political meetings (e.g., a gathering of flags and representatives from different countries), for instance.

Discussion and Conclusions

General findings from both textual and visual analysis are that all frames support readers' learning (or making meaning) to a limited extent. As observed in the macro, meso and micro frames together, there are elements that promote knowledge acquisition and comprehension, but hardly texts provided further analysis, evaluation, a better balanced (e.g., diverse points of views from participants in events) and textured information, or news' articles could rather be short. In addition, the low number of organizations (6) that published together with the low number (14) of contextualized news' articles about CC in 2014, is likely hindering the large Latin American audience's knowledge about effects and solutions for the region. It is important to note that these are official sources of information also for news agencies or wire services and journalists in the mass media. It is not surprising then why studies (Dotson et al., 2012; Takahashi & Meisner, 2012) have demonstrated that main discourses and information readily found in commercial or public mainstream news' providers (e.g., broadcast, newspapers) is mainly portraying international information like from industrialized countries. Indeed, these official sources are not the only providers of first hand information, however they are mostly contacted for prime information. Non-governmental organizations, research centers, foundations, to name a few, also provide CC information. However, a number of studies (Arcila-Calderón et al. 2015, Dotson et al., 2012; Takahashi & Meisner, 2012) have demonstrated media professionals or the public less consults them. An initial observation, although not herein studied, is that most of CC articles online were published

during international or regional events; most articles were indeed dedicated to the narration of an event, mainly. Given the qualitative character of this study, an upcoming article will delve more into quantitative results, for complementary purposes.

Given that CC news articles were published in a rich online environment, which enables to include multimedia with links to social media (e.g., Facebook, Google +), photo galleries, other related articles, and contact information, commonly not found in print media, the present study initially separated the educational frames from the integral ones in its research question. This due to the possibility to encounter this hypertextual resources within texts that permit readers' to navigate to other resources, as one of the forms of integrality. However, after further analysis of the final emerged frames (see Figures 1 and 2), other reflection comes to mind. In this sense, Integral Frames was placed well be placed under the greater theme of Education frames instead. Indeed, this integral characteristics found in texts do contribute to learning from the news. The fact that the reader is able to navigate for further information from within the text directly or choose any hypertextual options offered in the frame of the text may promote active learning (Shapiro & Niederhauser, 2004). Furthermore, the Integral Frames subtheme not only defined links within texts (or Signposts category or meso frame) but also identified Diversity and Connections categories or meso frames, respectively. Such meso frames demonstrated that texts do include information that helps the reader delve into the complexities of the CC interdisciplinary character. In this regard, Figures 1 and 2 clearly illustrated such purpose. However, it is certainly reasonable that the Diversity frame (e.g., diversity of representatives) and the Connections frame emerged in texts do pertain to the Cognitive and Contextual Frames, as they contribute to factual and explanatory information for knowledge and comprehension.

Regarding the Cognitive and Contextual macro frame, it responds to the characteristics mainly reflected by the Explanatory and Factual Information meso frames. In cognitive, educational psychology and online learning literature, there are at least three theoretical models that support learning from the news and online media. These are a) the Cognitive Mediation Model (CMM) (Eveland, Jr., 2001), which includes the need for self-motivation for learning to occur from the news media, b) the Construction Integration Model (CIM), which explains learning from the news occurs in a three-stage process and c) the Cognitive Flexibility Theory (CFT), which explains learning also occurs from the possibility to use multiple perspectives (e.g., navigating from one source to another as in online environment) (Lowrey & Kim, 2009; Shapiro & Niederhauser, 2004). Although these are not going to be herein analyzed, these are crucial to improved CC news' generation. In educational literature, Marzano & Kendall (2007, 2008) have proposed a new taxonomy of educational objectives in three dimensions, which explains how educational objectives can address from low to high-order thinking (e.g., from knowledge

acquisition to self-evaluation or how do we think about what we learn). This taxonomy provides examples of how cognitive process takes about and may be contrasted with frames emerged. Under the taxonomy "facts" are required to trigger a "Retrieval" cognitive process level in an individuals' thought, which corresponds to an initial cognitive processing level, a basic one (Marzano & Kendall, 2008). In order to trigger a next processing level named as "Comprehension", it is necessary to count with further explanatory information that assists in an immediate construction meaning (Marzano & Kendall, 2008). Put in the context of the present study, the meso frames or categories named as Factual and Explanatory Information, respectively, basically included micro frames that represented facts (e.g., Representatives, events or projects titles, names, dates) and more complex elaborations that aid comprehension (e.g., Conditions-effects of climate change). Very little (almost none) emerged micro frames promoting at analytical or comparative information (e.g., Contrasts), which may induce to even higher-order thinking levels in a reader like analytical, evaluational and/or meta-cognitive levels (Marzano & Kendall, 2008). It has already been argued the limited educational power news media can promote in the reader (Eveland, Jr., 2001). In bold words, an article alone will not induce more than a comprehensional level of processing in a reader. Thus, to attain higher order thinking levels, it is necessary to have a self-motivation to do so like having a vested interest in further researching about the topic and navigating to diverse resources as promoted by the CMM (Eveland, Jr., 2001) and the CFT (Shapiro & Niederhauser, 2004). As observed in the emerged frames, all analyzed news articles are clearly limited to knowledge acquisition and basic comprehension. Certainly, the use of inverted pyramids (most commonly used in these articles) are limited themselves in format, structure, and texturization of a publication. CC news' from official sources must be improved in its scope and content of the information, delivery format to promote deeper cognitive processing of the reader. An article can be upgraded in its educational objectives by supplying a diversity of online quality resources as well (although not analyzed in this study).

Frames emerged during visual analysis included the same macro, meso and micro frames except for Signposts frames as images do not contain any links or contact information in them. However, in the case of Factual Visual Information category, the micro frame used was DATA as images do not necessarily clearly showed a title or a name or indicator. These were either in the background, not in the focal point or blurred. Facts had mainly a complementary role in images. The main visual articulation was rather to explain and expose the main theme of the article in the ensemble of its components. For example, an event with representatives and a discourse. Under the integral frames mainly a diversity of official representatives were shown in images and very little display of images, which actually showed the complexity of climate change in the region. Although not explored in this study but strikingly evident was the domination of men in images. Other symbolic elements pretty much portrayed were flags. In general terms, CC

was portrayed in this study as mainly a matter of human, political debate and to a much less extent photography visualized aspects of CC in the region. Concurrent with DiFrancesco & Young (2010), who applied content analysis to images of CC in Canadian print media, images are basically focused on humans and much less on nature. Humans portrayed were mainly political oriented and portrayed posing, in a press conference or parliamentary performance, not that distant on how they are portrayed in the present study. Furthermore, DiFranceso & Young (2010) found images were not consistent with text narratives in CC news' articles.

Regarding cognitive acquisition, images assist in the cognitive process of comprehension (Marzano & Kendall, 2008) through a process of integration of the "symbolic analog" present in photography or imagination. The images alone fail to tell the whole story in the present study. Thus, their role is complementary, though not less important. Looking further afield, visual representations of CC –and many other environmental challenges– have already been claimed as a complicated task given that CC is invisible and long-term in nature (Hansen & Machin, 2015; Scrhot, Angel, Sheppard, & Dulic, 2014; Sheppard, 2012). Sheppard (2012) promotes reframing audiences perspective of carbon or displaying mitigation and adaption solutions in an appropriately contextualized manner. Put in the context of this study, visual representations of CC fail to promote solutions, but have mainly promoted contextual visual constructions, though in a low number of images.

Finally, articles with its images have been mainly published with a traditional print media structure (text and one image attached to it but in an online environment, which allows more interactive features and publication formats. Few publications supplied a photo gallery. It is therefore advisable to use all distinctive features of an online environment in order to provide a set of images that together may provide a better visual story and improve the readers' interaction with the news article.

The present study is limited to its exploratory and qualitative reverse nature. Therefore, this initial approximation to a frame construction will follow further study in an upcoming publication.

References

Anderson, A. (2009). Media, politics and climate change: Towards a new research agenda. *Sociology Compass*, 3, 166–182. doi:10.1111/j.1751-9020.2008.00188.x

Boykoff, M. T. (2011). Who speaks for the climate? Making sense of media reporting on climate change. Cambridge, MA: Cambridge University Press.

Boykoff, M. T., & Boykoff, J. M. (2007). Climate change and journalistic norms: A case-study of US mass-media coverage. *Geoforum*, *38*(6), 1190–1204. doi:10.1016/j.geoforum.2007.01.008

DiFrancesco, D. A., & Young, N. (2010). Seeing climate change: The visual construction of global warming in Canadian national print media. *Cultural Geographies*, *18*(4), 517–536.doi:10.1177/1474474010382072

Dotson, D. M., Jacobson, S. K., Kaid, L. L., & Carlton, J. S. (2012). Media coverage of climate change in Chile: A content analysis of conservative and liberal newspapers. *EnvironmentalCommunication*, *6*(1), 64–81. doi:10.1080/17524032.2011.642078

Eakin, H., Wightman, P. M., Hsu, D., Gil Ramón, V. R., Fuentes-Contreras, E., Cox, M. P., …Kammen, D. M. (2015). Information and communication technologies and climate change adaptation in Latin America and the Caribbean: A framework for action. *Climate and Development*, *7*(3), 208–222. doi:10.1080/17565529.2014.951021

Eveland, Jr., W. P. (2001). The cognitive mediation model of learning from the news: Evidence from nonelection, off-year election, and presidential election contexts. *Communication Research*, *28*(5), 571–601. doi:10.1177/009365001028005001

Hansen, A., & Machin, D. (Eds.). (2015). *Visual environmental communication*. New York, NY: Routledge.

Gavirati, P. M. (2013). Los medios en el medio (de la solución al cambio climático). Una propuesta críticadesde la ecología política de la diferencia [The media in the middle (of the solution to climate change). A critical proposal from the political ecology of difference]. *Razón y Palabra*, *18*(84). Retrieved from http://www.redalyc.org/articulo.oa?id=199528904012

Hibberd, M., & Nguyen, A. (2013). Climate change communications & the young people in the Kingdom: A reception study. *International Journal of Media & Cultural Politics*, 9(1), 27–46.

Internet World Stats. (2016). World Internet Usage and Population Statistics [online] Retrieved from http://www.internetworldstats.com/stats.htm

Lowrey, W., & Kim, K. S. (2009). Online news media and advanced learning: A test of cognitive flexibility theory. Journal of Broadcasting & Electronic Media, 53(4), 547-566.doi:10.1080/08838150903323388.

Marzano, R. J., & Kendall, J. S. (2007). *The new taxonomy of educational objectives* (2nd ed.).Thousand Oaks, CA: Corwin.

Marzano, R. J., & Kendall, J. S. (2008). Designing & assessing educational objectives: Applying the new taxonomy. Thousand Oaks, CA: Corwin.

Mercado, M. T. (2013). De la reducción de emisiones al cambio de paradigma: La construcción social de las soluciones al cambio climático en la prensa argentina [From emissions reduction towards paradigm change: Social construction of solutions to climate change in the Argentinian press]. *Razón y Palabra*, *18*(84), Retrieved from http://www.redalyc.org/articulo.oa?id=199528904005

Peña Moya, J., de Frutos García, R., & Díaz Estévez, M. (2013). La transmisión del consenso científico sobre el cambio climático a la ciudadanía. Estudio comparado de las opiniones de jóvenes universitarios del arco Mediterráneo-América Latina con estudiantes del areaAnglosajona y Asiática [Transmission of scientific consensus on climate change to the citizens. Comparative study of young undergrads' opinions in the Mediterranean-Latin America arch with students in the Anglo-Saxon and Asian area]. *Razón y Palabra*, *18*(84). Retrieved from http://www.redalyc.org/articulo.oa?id=199528904009

Price, V., Tewksbury, D., & Powers, E. (1997). Switching trains of thought: The impact of news frames on readers' cognitive responses. *Communication Research*, *24*(5), 481–506.doi:10.1177/009365097024005002

Saldaña, J. (2013). *The coding manual for qualitative researchers* (2nd ed.). London: Sage.

Schäfer, M. S. (2012). Online communication on climate change and climate politics: A literature review. Advance online publication. WIREs Clim Change. doi:10.1002/wcc.191

Schäfer, M. S., & Schlichting, I. (2014). Media representations of climate change: A meta-analysis of theresearch field. *Environmental Communication*, *8*(2), 142–160.doi:10.1080/17524032.2014.914050

Schlichting, I. (2013). Strategic framing of climate change by industry actors: A meta-analysis. *Environmental Communication*, *7*(4), 493–511. doi:10.1080/17524032.2013.812974

Schreier, M. (2012). *Qualitative content analysis in practice*. London, England: Sage.

Schroth, O., Angel, J., Sheppard, S., & Dulic, A. (2014). *Environmental Communication*. Advance onlinepublication. Retrieved from http://dx.doi.org/10.1080/17524032.2014.906478

Schuldt, Jonathon P., & Roh, S. (2014). Media frames and cognitive accessibility: What do "Global Warming" and "Climate Change" evoke in partisan minds? *Enviromental Communication*. Advance online publication. doi:10.1080/17524032.2014.909510

Shapiro, A., & Niederhauser, D. (2004). Learning from hypertext: Research issue and findings. *Handbook of Research on Educational Communications and Technology*, 2, 602–620. Retrieved from http://www.aect.org/edtech/ed1/23.pdf

Sheppard, S. R. J. (2012). *A Guide to visual communication of climate change and developing local solutions*. New York, NY: Routdlege.

Shrestha, S., Burningham, K., & Grant, C. B. (2014). Constructions of climate change on the radio and in Nepalese lay focus groups. *Environmental Communication*, *8*(2), 161–178. doi:10.1080/17524032.2014.906480

Smith, J. (2005). Dangerous news: Media decision making about climate change risk. *Risk Analysis*, *25*(6), 1471–1482.

Spiro, R. J., Feltovich, P. J., Jacobson, M. J., & Coulson, R. L. (1992). Cognitive flexibility, constructivism and hypertext: Random access instruction for advanced knowledge acquisition in ill-structured domains. In T. Duffy & D. Jonassen (Eds.), Constructivism and the Technology of Instruction. Hillsdale, NJ: Erlbaum.

Spiro, R. J., & Jehng, J. (1990). Cognitive flexibility and hypertext: Theory and technology for the non-linear and multidimensional traversal of complex subject matter. D. Nix & R. Spiro (eds.), Cognition, Education, and Multimedia. Hillsdale, NJ: Erlbaum.

Soares Veiga, A. P. (2013). A cobertura da apresentação do modelo brasileiro do sistema terrestre pela mídia digital: Análise qualitativa e comparative [Coverage of the presentation of the Brazilian model of terrestrial system for digital media: Qualitative and comparative analysis]. *Razón y Palabra*, *18*(84). Retrieved from http://www.redalyc.org/articulo.oa?id=199528904013

Takahashi, B. (2011). Framing and sources: A study of mass media coverage of climate change in Peru during the V ALCUE. Public Undertanding of Science, 20(4), 542–557.doi:10.1177/0963662509356502

Takahashi, B. (2013). La influencia de las agencias internacionales de noticias en la cobertura delos efectos y las soluciones del cambio climático: Un estudio de caso del Perú [Influence of international news agencies in the coverage of effects and solutions to climate change: A case study in Peru]. *Razón y Palabra, 18*. Retrieved from http://www.razonypalabra.org.mx/N/N84/M84/07_Takahashi_M84.pdf

Takahashi, M., & Meisner, M. (2012). Climate change in the Peruvian newspapers: The role of foreign voices in a context of vulnerability. Public Understanding of Science, 22(4), 427–442. doi:10.1177/0963662511431204

Tankard, Jr. J. W. (2001). The empirical approach to the study of framing. In S.D. Reese, O. H. Gandy, & A. E. Grant (Eds.), *Framing public life: Perspectives on media and our understanding of the social world* (pp. 95–106). Mahwah, NJ: Lawrence Erlbaum.

Zhao, X., Maibach, E., Gandy, J., Witte, J., Cullen, H., Klinger, B. A., … Pyle, A. (2014,January). Climate change education through TV weathercasts: Results of a field experiment. *American Meteorological Society*, 117–130.

Zamith, R., Pinto, J., & Villar, M. E. (2012). Constructing climate change in the Americas: An analysis of news coverage in U.S. and South American Newspapers. *Science Communication*, *35*(3), 334–357. doi:10.1177/1075547012457470.