

Hypertext newswriting effects on satisfaction, comprehension and attitudes

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Abstract

More than a decade after the beginning of online journalism, the great expectations of this field of expertise remain unfulfilled. Hypertextuality, multimediality, and interactivity remain original marks as yet unexplored by journalism made on the web (though not for the web).

In the specific case of hypertextuality, the subject of this study, its little use is linked with journalists' time constraints, the absence of an organizational model not limited to copying printed papers, and the fear that readers may reject non-linear reading (Paul, 2005). The latter reason is likely what is most hindering the evolution of web journalism, despite the great potential of online news formed by networks of linked texts. To begin with, it frees the reader, giving them the option to create their own path of reading. Additionally, it offers extra contextual information about the subject, allowing readers to increase their knowledge on the subject according to their own interests.

Despite the apparent advantages, such textual networks demand an additional effort of readers to interact with the theme. They must follow links, and skip from text to text, which may be perceived as obstructive to their reading. The passivity imposed by the most powerful medium, television, and the recipients' deeply-rooted habit of linear readings raise an important question:

Will readers value the hypertext contexts to such an extent that they will make that additional effort, or are the newspapers right in their fears of the readers's reaction?

In an attempt to answer this question, an experimental study was carried out assessing the effects of hypertext on levels satisfaction, perception, comprehension, and attitudes

of online news readers. Two news articles with the same contents were created; however, they were presented in different formats: one with the traditional layout - printed news (single text), and the other an assemblage of different texts connected through web links.

Two test groups, formed by students, read each of the online news and answered the same survey immediately after the test. The data, statistically treated using SPSS, allow the conclusion that there is a significant difference between groups in some of the surveyed items, and favor the hypertextual online news.

1. Introduction

Hypertext in this study is understood as a non-linear interactive text, having as only support a computer (Nelson, 1980). A subsequent definition defines hypertext as a group of documents, presented on a computer monitor, linked through database objects through a mouse click (Conklin, 1987). This latter definition reveals a shift towards the idea of hypermedia document as a hypertext linking information blocks with different kinds of media content (Nielsen, 1995; Hardman *et al*, 1990).

The previous definitions indicate that hypertext represents a major contribution to research developed by web journalism. Its power is felt throughout all fields of web journalism because it interacts with both the language and the way the readers interact with the contents.

This characteristic is particularly important as it highlights a crucial distinction in relation to the printed press news – not merely because it is hypertextual news, but because it elicits direct action from the readers, such as clicking on the hyperlink of a word or image. From the moment the reader takes action, the comprehension of the contents becomes individual: they have made a decision based on their own perception, thus creating a personal reading sequence that does not necessarily match choices made by others.

The hypertextual news writing technique is presented as liberating both for readers and journalists at the same time. It obliterates printed text linearity and the notion of a single, isolated text, allowing both the reader and the writer more freedom (Landow, 1995). This interpretation of hypertextual meaning stresses the need of action by a dynamic reader. By choosing a specific path of reading, this reader creates temporal sequences, changing the course of the description. Hence, this type of text can be viewed as having multiple authors, without a predefined beginning or end.

This notion concurs with Roland Barthes' (1970) definition of ideal text, later reinforced by Pierre Lévy (1993), when referring to groups of information items - texts or images - connected through links that allow a reading as complex as the possibility of choosing different reading paths. This idea of hypertext, now applied to journalistic practice and followed by other authors (Hall, 2001; Noci & Salaverria, 2003), is the subject of the present paper.

This intricate network of texts and links allows an infinite number of architectures (Theng *et al*, 1996), thus compelling hypertextual writers to map out a previous draft of the system, a contents guide player, and to mark its affinity with similar subjects available on the web. The free navigating, in an almost endlessly generated information network, creates a dynamic memory. This memory mimicks human memory, which is based on the association of elements with shared characteristics. Those elements are information groups (text, image, sound or infographics) and their association is achieved through links.

In addition to the materials – information groups and links - the productions of a web news story must follow rules that are necessarily different from the ones used for the writing of printed news. By using a different media support from the printed press, web journalism must devise its own features or it will be doomed to failure (Pisani, 2001). Thus, the web news develops through an architectural chain of information groups linked together, the latter accomplishing two main aims inherent to its documental and narrative functions (Salaverria, 2005).

1. In their documental function, links offer the choice of building a potentially infinite web of information. The use of this type of connection allows the creation of news with different reading levels. More demanding readers may increment their knowledge of a specific subject, skipping from information group to information group until they attain deeper levels. In turn, busier or less demanding readers may access only the essential data by interacting less with the content and attaining only a superficial level of understanding. Thus, the variability of this function is essentially the quantity of information.

2. The narrative function is associated with the potential of creating reading paths. The most important thing is the way in which the user reads the web news story, not than the quantity of information on a given event. This will depend on the journalist's link policy. The way in which the journalist links the groups of text conditions the architecture of, which in turn governs the nature and meaning of the narrative when restricting the reading paths (Hall, 2001). This implies that when writing a web story, the journalist must manage at least three new variables, which are:

i) Criteria inherent to the allocation of information in groups. ii) Group distribution though different levels of reading. iii) Choice of key words.

As regards the edition, the management of the resulting variables inherent to both functions affects the editing of hypertextual writing. On the other hand, another variable on the users' part must be considered: a linear reading tradition over four thousand years old.

Indeed, linearity is one of the strongest features of the printed word; in the West we acknowledge that the text sequence has a predefined meaning and that the pages of a book or newspaper always follow the same linear organization. We know that letters joined together from left to right create words, and that these, joined together in the same direction make up sentences, that give form to paragraphs, which together are chapters, which as a whole become a book.

When reading a text we are constantly seeking its meaning, searching for a link or association with what we have read before (Sperber & Wilson, 1986), i.e. we ascertain

the meaning based on a logical link to ulterior linear parts. However, in hypertext information is fragmented into autonomous components that generate a particular reading, regardless of the texts read before and of the ones which will be read after (Landow, 1995). Thus we enter the field of non-linear textuality, i.e. of verbal communication objects that reach beyond the simple sequence of words, having the possibility of conveying different meanings according to the reading choices of the user (Arseth, 1994).

Only the beginning being chosen by the author, the text takes on the discontinuity of the digital worlds, which means each user chooses their own path of reading according to their interests (Holtzman, 1997). The shift in paradigm resulting from the non-linearity of the text and the freedom from previously defined reading paths may represent a potential difficulty for users, and therefore an obstacle for web newswriting using hypertext. It seems that an intuitive navigation system, simple and easy, is absolutely necessary to make the reader comfortable in the course of reading (Theng *et al*, 1996); and when feeling comfortable, readers will have a more gratifying experience. Research carried out by Berger (2001) identifies a positive correlation between hypertext reading comfort and user fulfilment. This comfort results from two factors: an intuitive navigation interface and the user's experience in reading hypertext.

The result is a group of users that present high levels of satisfaction and comprehension perception, evaluating positively the web news story in terms of accuracy.

However, though hypertext writing has great potential, it can also pose some difficulties. It is necessary to understand the best way in which to write an article for the web.

2. Method

An experimental study was carried out with two random groups of 25 participants each. An independent variable was manipulated. One group received a particular treatment and the other received an alternative treatment and served as control group. To ensure the internal validity of the investigation, after a random distribution of the participants

between the two groups, a questionnaire was distributed to assess the balance between groups, eliminating any eventual rise of contaminating variables.

2.1 Participants

Having first been established that all computers had the same technical features, a room was then equipped with 25 computers. It was explained to the participants that this study was related with journalism; therefore they should read the news in their usual way.

After reading, all participants filled in a questionnaire, stating socioeconomic details (such as age and sex), internet habits (e.g. years of use, daily time of use, places where connection is established, internet services used, percentage of news usually read in the internet) and online reading habits. The balance of the experimental groups was assessed through analysis of these questionnaires, an essential condition to ensure the internal validity of the study.

2.2 Dependent measures

2.2.1 Attitude regarding the journalistic product

Since the web news story has different features from the ones usually found in online newspapers, it was important to understand the participants' opinions as to the proper use of language and the medium. Thus, 10 statements were presented to the participants: 1. The story was produced in accordance with the medium (web); 2. The language used is innovative; 3. The design is adequate; 4. The structure of the piece is user-friendly; 5. The news design is innovative; 6. The language used is appropriate for the web; 7. The navigation system is easy to understand; 8. This language fulfils my needs; 9. The option of choosing reading paths is positive; 10. The language enhances the contents.

The ten items included in this variable were related to three attitude types: innovation, adequation, and expectations regarding the media. Thus the fragmentation of the attitude variable in more than one factor was expected in certain situations.

- *Innovation* (items 2 and 5): When giving high scores to these items, the participants consider that the contents add something new to the information they know and are familiar with.

- *Adequation* (items 1 and 6): High scores show coherence between content and the medium (web). In this case participants found the language to be in agreement with the medium's characteristics, a crucial factor in this line of work.
- *Expectations* (items 7, 9 and 10): The participants' high expectations concerning content indicate a predisposition to interact with that same content as it affords a sense of gratification. That is attested to when scoring high on these three items.

2.2.2 Perception of theme comprehension

The word comprehension implies that the recipient is able to extract from the message the meaning intended by the writer. Measuring comprehension would imply using research techniques especially designed to determine variables such as memory. However, it has been proven that previous knowledge of certain matters increases the comprehension levels of the news, influencing the results (Van Dijk, 1990). As such, it could jeopardize the internal validation of the results. Thus, in this experiment it was decided to measure the perception of comprehension, in an attempt to understand how the reader has the notion of having understood the message.

In order to assess the perception of comprehension 5 statements were used: 1. How did you understand the news?; 2. The information is easy to understand; 3. The news has sufficient information about the subject; 4. The news is presented in a clear way; 5. The news is sufficiently detailed.

The items that form this variable are divided into two groups, one that directly enquires on the perception of comprehension (1, 2, 4) and another that addresses in greater indepth the participants' notion that the news has been sufficiently explored to provide a wide-ranging outlook of the issue.

With this subdivision, two new factors were possible: comprehension perception and contextualization (contextual perception).

The participants evaluated each item according to a 10-point scale, ranging from 1 (nothing) to 10 (everything).

2.2.2 Satisfaction

Satisfaction is an important concept in various areas of human communication, and particularly in the journalistic field. In terms of media communication, the term satisfaction can appear linked either to features or contents of the media. In this particular case it was deemed important to know whether the independent variable has any significant influence on the different levels of satisfaction and gratification experienced by participants.

The assessment of satisfaction levels was undertaken using a survey with 5 statements: 1. In which way was the reading of the news gratifying? 2. In which way has the news increased your interest in the theme? 3. How did you like the news? 4. Did you think the information is relevant? 5. Did you feel involved in the content of the news?

Participants rated each item using a 10 points scale, ranging from 1 (nothing) to 10 (everything).

2.3 Data analysis

Statistical tests (student's *t*, variance analysis, and *chi-square* tests) were used and with the support of SPSS (computer software) they allowed the analysis of the differences between the two experimental treatments of the dependent variables.

The *Student's t* test is one of the tests most often used in experimental treatments with two groups, because it allows comparing scores (averages) on the independent variable of two homogenous groups undergoing two different kinds of treatment. In turn, the *chi-square* test allows assessing if the variables are effectively independent or if on the contrary there is an connection between them. Multivariate statistical tests (factor analysis) were also used in this study to simplify data reduction and the elaboration of indexes more suitable to the dependent variables considered.

2.4. Procedure

Fifty first-year Architecture students from Universidade da Beira Interior participated in this study (average age 19,8 years old, 64% women).

Two news with the same textual content were prepared. One of them was written following the inverted pyramid technique and on the lead the six fundamental questions were answered: who, what, when, why, and how. Subsequently the theme was developed using independent paragraphs organized by decreasing order of importance. The other news, a webnews, used the same inverted pyramid technique. However, the information which in the first version was presented in text groups separated by a title, was here replaced by information groups linked through words inserted in the lead text.

In order to avoid contaminating variables, the article offered a redundant navigation system, since it was also possible to move from group to group following links at the end of each news. These links were placed in words similar to the titles of the first version of the news (fig.1)

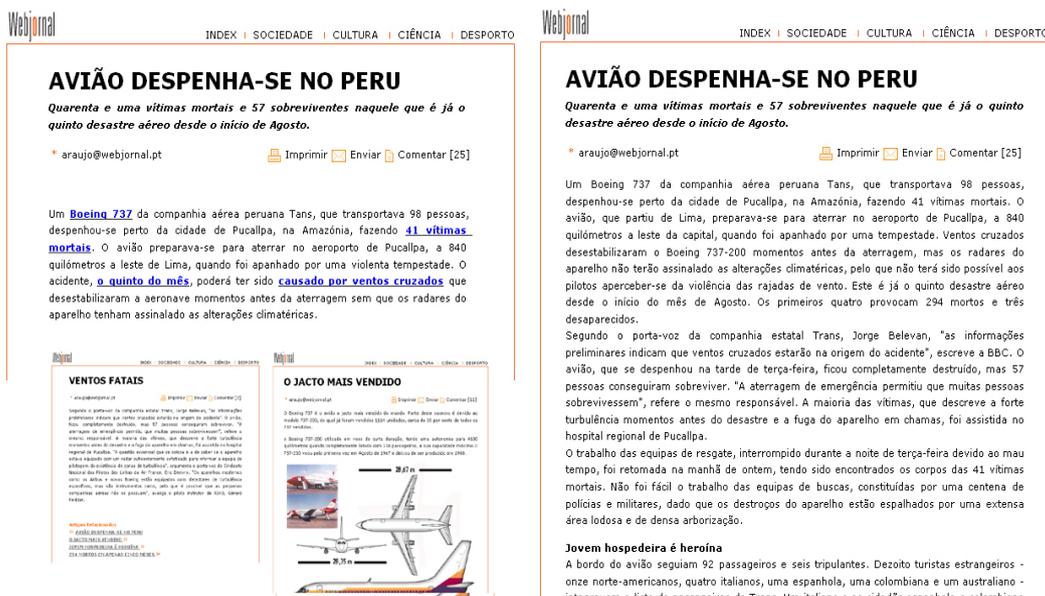


Fig. 1

The news theme was the fall of a plane in Peru. Besides the essential information presented in the lead, additional information (information groups in the case of the webnews and subtitles in the case of the printed news) related with the heroic action of a flight attendant, probable causes for the accident, number of similar accidents over the last years, and the technical features of the plane involved in this accident were also presented.

In the latter case, the image used was the same, although in the hypertextual news it was presented as an autonomous group of information, while in the printed news it appeared at the end of the text.

3. Results

3.1 Assessment of the homogeneity of experimental groups

No statistically visible differences were observed between participants of the two groups, with the exception of the percentage of news read daily on the internet. Though ($t(48) = -1,907, p = 0,063$) is a minor difference in terms of group homogeneity, it must be considered in the discussion of results.

3.2 Attitudinal impact

The factorial analysis of the main component (with Varimax rotation) extracted two factors that together explained 60,552% of the variance. The first factor, formed by 9 items, explained 33,688% and the second, formed by 8, items, explained 26,864% of the variance.

Table 1 – *Attitudinal Factors*

	Factors	
	1	2
The story was produced in accordance with the media (web) (M=3,58 ; SD=1,108)	0,66	0,49
- The language is innovative (M=3,13 ; SD=0,937)	0,80	
- The design is adequate (M=3,24 ; SD=1,041)	0,30	0,57
- The news structure is agreeable (M=3,22 ; SD=1,130)	0,42	0,71
- The news design is innovative (M=2,85 ; SD=1,000)	0,70	0,32
- The language used is appropriate for the web; (M=3,80 ; SD=0,756)	0,43	0,66
- The navigation system is easy to understand; (M=4,36 ; SD=0,722)		0,83
- This language fulfils my needs (M=3,75 ; SD=0,934)	0,64	0,38
- The option of choosing reading paths is positive (M=3,81 ; SD=1,045)	0,53	0,45
- The language enhances the contents (M=3,44 ; SD=0,873)	0,77	
% de variance	33,68	26,86

With these results two variables were created through the simple addition of items with higher factorial charges. Later, the veracity of the referred indexes was asserted through

the *Cronbach Alfa* coefficient. The results show that viability was adequate both to the first factor –innovation- ($\alpha=0,855$) and to the second –adequation- ($\alpha=0,748$).

Table 2 – Impact on attitudes

Dependent variable	News with ...		<i>t</i>	<i>gl</i>	<i>p</i>
	Text	Hypertext			
Innovation	3,06	3,73	-3,542	46	0,001
Adequation	3,31	4,00	-3,966	48	0,000
N	23	25			

Scale: from 1= totally disagree, to 5 = complete agreement.

The *Student's t* test was used to find differences in the two attitude variables regarding the version read. Significant differences between the experimental groups were found in the innovation item ($t(46)=-3,542$, $p<0,001$) and in the adequation item ($t(48)=-3,966$, $p<0,000$). In both cases the positive impact caused by the hypertext news was clearly noticeable, as it was considered the most adequate to the medium ($M=4,00$; $SD=0,51$) and the most innovative news ($M=3,73$; $SD=0,54$) by the participants.

3.3 Impact of the experiment on comprehension perception

The main component factorial analysis (with Varimax rotation) extracted two factors that explained 73,469% of the variance. The first factor, composed of 3 items, explained 43,912%; the second, composed of 2 items, explained 29,556% of the variance.

Table 3 – Comprehension perception factors

	Factors	
	1	2
How did you understand the news? ($M=8,3$; $SD=1,56$)	0,797	
The information is easy to understand; ($M=7,88$; $SD=1,87$)	0,936	
The news has sufficient information about the subject; ($M=7,54$; $SD=2,29$)	0,810	
The news is presented in a clear way; ($M=7,48$; $SD=2,11$)		0,849
The news is sufficiently detailed. ($M=7,40$; $SD=1,94$)		0,827
% of variance	43,91	29,55

With these results two variables were created through the simple addition of items with higher factorial charges in each factor. Later, the veracity of the referred indexes was asserted through the *Cronbach Alfa* coefficient. The results show veracity was adequate

in both cases ($\alpha=0,805$ y $\alpha=0,608$, respectively). The items grouped in the first factor were mainly connected to comprehension variables, while the second were related to the contextualization of the event reported by the news.

Table 4 – Impact on perception of the comprehension variables

Dependent Variables	News with ...		<i>t</i>	<i>gl</i>	<i>p</i>
	Text	Hypertext			
Comprehension	7,12	8,69	-3,833	48	0,000
Contextualization	7,36	7,52	-0,325	48	0,746
N	25	25			

Scale: from 1 (Nothing) to 10 (Everything).

No statistically significant differences were noticed between both groups ($t(48)=-0,325$, $p=0,746$). However, in the specific case of comprehension, significant differences were identified among the conditions ($t(48)=-3,833$, $p<0,000$), and once again the hypertextual reading group presented higher levels of comprehension perception ($M=8,69$; $SD=1,12$).

3.4 Experimental impact on satisfaction

The factorial analysis applied to the scale used to evaluate satisfaction extracted only one factor which explained 74,523% of the variance ($\alpha=0,912$).

Table 5 – Impact on Satisfaction

Dependent variable	News with ...		<i>t</i>	<i>gl</i>	<i>p</i>
	Text	Hypertext			
Satisfaction	29,20	33,76	-1,828	48	0,074
N	25	25			

Scale: from 5 (Minimum) to 50 (Maximum).

Tendencial differences between groups were also identified ($t(48)=-1,828$, $p<0,074$).

The group that read the hypertextual news presented higher levels of satisfaction ($M=33,76$; $SD=8,09$).

4. Discussion and conclusions

Although the author of hypertextual web news expects the user to navigate the contents in order to optimize the reading, it has been demonstrated that the way in which we surf

the web is much more determined by our experience of the internet than by our interest in the contents (Mitra, 1999). This idea supports the need to carry out this type of research, using homogeneous groups of participants, which apparently did not happen before. Although both groups of participants were homogeneous in terms of years of using the internet, daily time of connection, and the way they read news, a tendencial difference was detected as to the percentage of news read daily on the internet. This factor needs to be considered, as it was noticed that internet experience is important in the way users navigate.

However, the impact on attitudes showed a significant difference in the innovation item, with hypertext participants considering the news read as novelty. This finding allows me to suggest that a high reading level of news on the web revealed by the hypertext readers group is a variable with no significant influence on the results, since these readers also usually read traditional printed news (i.e. not using hypertext). Little contact with hypertextual news might justify the association between hypertext and innovation, but this factor loses importance and balances out the results of both groups, cancelling the eventual contamination of results by a variable peripheral to the research.

One of the problems most often mentioned in studies on the use of hypertext (Batra *et al*, 1993; Hammond, 1989; Marco, 2003) is the possibility that this type of content may create a sense of disorientation in users, a situation that could justify Lopez's view (2003) that users do not appreciate hypertext as much as is believed.

Admittedly, the lack of enthusiasm regarding hypertext may be related to the above mentioned sense of disorientation, which might in turn suggest a certain degree of dissatisfaction with the reading. Nevertheless, the results of this study point in the opposite direction: though tendencial differences between groups are visible in relation to the impact on satisfaction levels, hypertext readers clearly showed a higher rate of satisfaction. This allows conceiving a news architecture with high receptivity among users, which is relevant if we take into account that the search for journalistic information is one of the major motives leading users to navigate in the internet (Ko, 2002; Rubin, 1984).

An equally important datum observed throughout this study was the difference between groups in the attitudes item. Users considered hypertext more innovative and particularly more adequate to the medium. This latter factor is important because if users perceive the message as adequate to the medium, then it can attest to the existence of a journalistic language appropriate for the web. The fact that the recipients ask for contents with specific characteristics is significant, as it reveals the existence of certain expectations, and thus, a predisposition of the user to seek certain contents.

However, we must not forget that the effectiveness of the message depends on the compliance with three basic rules: 1) The existence of a large amount of information divided into small groups; 2) The interconnectedness of these groups through links; 3) That at given moments in the reading the user needs only a small amount of information to understand the content (Marco, 2003).

This implies that, besides language management, the way in which the information is fragmented into groups and the type of links used must follow construction rules. In agreement with previous studies, these must have a coherence which influences the comprehension of the text (Thuring *et al.*, 1995). The group of elements that make a text a logical unit is understood as coherence (Engebretsen, 1997). In the specific case of this study, global coherence was achieved, as significant differences between groups were perceived in terms of comprehension perception, and the hypertextual news was favored.

The data collected in this study suggest that when conforming to certain rules hypertextual writing has a significant impact on attitudes, on comprehension perception, and on the satisfaction levels of readers of web news. This set of rules, which can be considered as hypertextual grammar, must establish guidelines as to which words are to be linked (strong semantic relationship between word and content linked), how to link them (in the text or in a menu), and when to link them (where in the text).

Although the results were conditioned by the fact that the experiment was carried out in a laboratory with undergraduate participants, the results indicate that online journalism

must turn to hypertextual writing to address the net information of consumers' expectations.

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