

The effects of message framing on communication from Local Administrations to the Public

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Abstract

Local administrations and governments communicate with the public in both obligatory and voluntary ways. In all cases, they aim to ensure that their messages reach their recipients, are understandable, memorable and enter the citizens' decision-making process. This paper reports the results of an eye-tracking experiment combined with a structured questionnaire that tested whether positive versus negative message framing in text and images affects how well readers recall information, and how long they focus on web-page elements. Key findings show no significant effect of message framing on correct recall of either textual or visual information ($p = 0,52$ for text recall; $p = 0,48$ for picture recall) and no significant effect on time spent viewing the message itself. These results suggest that in the context of municipal website communication, positive or negative framing alone does not meaningfully enhance citizens' recall. This implies that other factors (e. g. content clarity, relevance) may be more decisive.

Keywords

Public administration, Communication; Message design, Information recall, Eye tracking, Message framing

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Highlights for public administration, management and planning:

- Content clarity, relevance, and design layout of the public administration messages may be more critical factors than emotional framing alone.
- Skimming is a common form of reading among the public when reading the information from public administration.
- If the text is interspersed with pictures, most readers pay most attention to the text and tend to skip the pictures.

1 Introduction

There is no doubt about the need for quality and open communication between public administration and the public. Therefore, administrative authorities not only fulfill their obligations to inform the public about their activities and plans, but also try to educate the public, expand their knowledge, and strengthen the position of the public through information. The public then become an important partner of public administration, a partner who participates in decision-making on public issues, who initiates solutions to public issues, who controls the activities of public entities. The public could not fulfill these roles without sufficient information.

In recent years, the topic of communication in public administration, or communication between local authorities and citizens, has significantly focused on e-government, electronic communication and social networks. The physical space where people communicate with each other is changing. Social media represents a new type of "forum" where people meet and communicate with each other and with local government and officials (Reddick et al. 2017; Barbeito-Caamaño & Chalmeta 2020). Social media (X, Facebook, YouTube, etc.) has become a common means of communication for citizens - they increasingly rely on it to communicate with their family, friends, colleagues, as well as administrative institutions. Websites have become a useful tool for building relationships with audiences. They

are in several ways superior to traditional mass media such as printed brochures, advertisements and newspapers (Topalian 2003; Hong 2013). The use of websites helps to provide readers with one central point of access to a large amount of information (Casaló et al. 2008; Santouridis et al. 2009; Kaya et al. 2019). Creating a favourable website design is crucial to their success (Melewar et al. 2017; Foroudi et al. 2019).

The capabilities of these types of media present new opportunities for government leaders at all levels to create and maintain relationships with individuals and entire groups, and to be informed by citizens, while also keeping citizens informed (Kavanaugh et al. 2012; Bonsón et al. 2019; Giacomini et al. 2021). When used properly, the online environment contributes to innovative participatory practices and offers opportunities for free networking and collaboration in open government (Mureşan 2016). The effectiveness of communication in public administration is often diminished by the “commercial” form of messages that citizens reject (Gracia & Casaló Ariño 2015; Cegarra-Navarro et al. 2012). The impact of communication in public administration becomes significant when the information is in line with citizens’ attitudes.

The demand for environmental disclosure is increasing due to the growing awareness of environmental issues among stakeholders (Che Ku Kassim et al. 2016). As a result, organisations are pushed to fulfil their responsibilities by providing information regarding environmental practices through various communication channels, and local governments are no exception.

With the growing global dominance of cities, there is a growing commitment to ensuring that cities are safe, healthy and equitable places to live and develop; this is embodied in many global development agendas. In the 2030 Agenda, Sustainable Development Goal 11.7 states “...: by 2030, ensure universal access to safe, inclusive and accessible green and public spaces, especially for women and children, older persons and persons with disabilities” (United Nations 2019). These agendas recognise both the importance of green spaces in urban areas and the need for a thorough understanding of how these spaces could be planned, developed and managed for the greatest benefit of all (Martínez-Córdoba et al. 2020). The benefits of urban green and blue spaces have long been recognised in academia, decision-making processes, urban planning and wider society. However, this fact still needs to be communicated to the public (Andrades Peña & Jorge 2019).

In this context, compared to traditional information disclosure systems, online communication can be considered as a powerful tool that gives citizens the opportunity to participate in public communication (Mergel 2013; Manetti & Bellucci 2016; Manetti et al. 2016; Giacomini et al. 2021). The effectiveness of digital communications is significantly determined by their content. Our study investigates how information should be presented on municipal websites to ensure that readers remember as much information as possible. Existing studies by Fan et al. (2024); Cheng & Zhang (2023); Shankar et al. (2022); Park et al. (2021) investigated the effect of the combination of text and images in digital communication on consumers’ purchasing intentions. A study by Luan et al. (2023) investigated the issue of message framing in the context of green consumption for profit. In contrast to these studies, our study examines the effect of content on citizens’ recollection of information to help public administration communicate with citizens.

2 Message design

All organisations using written communication have an interest in ensuring that their audiences can easily read and understand their text (Zhang & Ghorbani 2020). Walker et al. (2020) examined the effectiveness of information-based policy tools by evaluating the design of public information posters and what people focus on in them. They concluded that people look at the main slogans first and that posters with a positive slogan and a negative image have the highest recall rate.

An effective message format is narratives (or stories) that depict actors pursuing goals over time (Bruner 1986; Bevan et al. 2020). By this definition, almost all articles have a narrative format. Narrative journalism has become prevalent in recent years (van Krieken & Sanders 2019; Wardle 2006), especially on social media platforms and websites (Casero-Ripollés et al. 2020). Narratives help readers to transport themselves into the story, a form of processing that involves heightened attention, emotional engagement and imagery (Green & Brock 2000). Finally, narratives also encourage mental simulation of events (Escalas 2004), which can make them seem more realistic and authentic (Plangger & Campbell 2022). Narratives build on the foundations laid by work using ‘framing’ and ‘storytelling’ to understand themes related to green infrastructure and urban nature (Frantzeskaki 2019; Reimer & Rusche 2019; Mell & Clement 2019).

People receive messages from public organisations to a significant extent through websites, and even these must meet certain criteria to ensure high quality information. Successful websites must respond to requests for information in a useful way (Marsico & Levialdi 2004). When people are exposed to complex information and text on websites, they tend to simplify the task by relying on mental shortcuts or heuristics (Lin et al. 2016; Metzger & Flanagan 2015). Therefore, complex text causes difficulties in processing information and barriers to attitude formation (Reber et al. 2004). In contrast, when a passage of text is easy to read, people can process information and receive messages fluently, and therefore their attitude towards the target topic which they are learning about becomes more favourable (Tang & Jang 2011).

It has been widely reported that both visual and textual elements in a marketing context capture consumers' attention (Percy & Rossiter 1997; Singh et al. 2000; Pieters & Wedel 2004; Cerf et al. 2009; Li et al. 2016). Consumers tend to spend more time viewing images when the task is to remember the brand (Pieters & Wedel 2007; Wu et al. 2020). Processing visual stimuli appears to require unconscious and unintentional processing, whereas verbal stimuli require a higher level of cognitive effort (Underwood & Klein 2002).

An advantage of using text can be that its meaning can be clear and unambiguous. The interpretation of text usually depends on the context in which it is presented. Therefore, the text itself may be ambiguous because its meaning may depend on other words, images, and objects encountered (Schiffstein et al. 2011). On the other hand, a picture can be a more powerful means of conveying a message than text because it tends to convey more aspects and more details simultaneously. However, the type and amount of information in an image can vary depending on the style of the image, ranging from pictorial (e.g., photograph) to non-pictorial (e.g., symbol) (Samara 2007; de La Ville & Krupicka 2016).

People are more likely to remember negative information than positive information (Cheung & Thadani 2012; Sánchez-García & Currás-Pérez 2011). Negative information is transmitted more easily than positive information (Fessler et al. 2014; Bebbington et al. 2017; Boyer 2020). Some research challenges these findings (Berger & Milkman 2012; van Leeuwen et al. 2018; Stubbersfield et al. 2018; Altay & Mercier 2020). For example, it has been found that positive content is more viral than negative content (Berger & Milkman 2012) and that morally good content is transmitted with

greater fidelity compared to neutral or morally bad content (Stubbersfield et al. 2019).

3 Methods

The primary objective was to determine how information should be presented on municipal websites so that their readers remember as much information as possible.

Four hypotheses were established to meet the objective:

H1: The version of the message (text and image) has an effect on information recall.

H2: Interest in "reading more" is dependent on the positive or negative version of the text.

H3: The length of time participants spent viewing the displayed image depends on the different (positive/negative) framing of the image.

H4: Time to first fixation depends on the positive/negative version of the message.

A structured questionnaire survey was used to test information recall. We hypothesise that the choice of style/framing of information and graphical elements (images) plays a role in influencing the time spent by website visitors. To test this assumption, an eye-tracking experiment was conducted. Ethical approval was obtained before implementing the study.

In the experimental design, eye tracking systems allow researchers to record participant eye movements during behavioural processes, providing "insight into the cognitive processes that underlie a wide range of human behaviours" (Ashby et al. 2016; Drèze & Hussherr 2003). In particular, the eye tracking technique provides precise information about people's visual attention in the form of fixations and patterns of visualisation (Vila & Gomez 2016; Alvino et al. 2021). The experiment presented is mainly focused on the informative side of things, as the main concern here is to determine the effectiveness of the message. In determining the effectiveness of a message, one can focus on whether the message effectively conveyed some knowledge and information.

The choice of a website as a communication tool for a municipality followed previous findings showing that websites are the main source of information flow from municipalities towards citizens. To conduct the eye tracking experiment, a fictional city website was created. The website published a report on the renovation of a city park, in a version with positively framed text (future higher environmental quality) and a supplementary image (Fig. 2), and in a version with negatively framed text (origi-

nal substandard condition) and a supplementary image (Fig. 3).



Fig. 1 Positive image

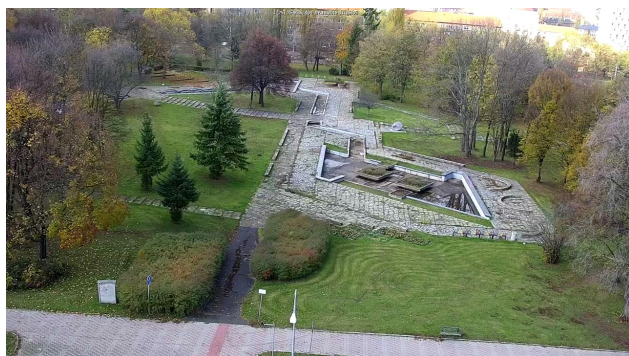


Fig. 2 Negative image

In addition, there were two other pieces of information on the website, one about a change to the City's office hours and the other about the City's autumn pest extermination programme. These two messages both had only one content and visual version. Only the data related to the city park renovation report was analysed and the effect of different (positive/negative) framing was tested based on this data.

Participants in the experiment were students of the Faculty of Economics, Faculty of Science, UJEP; each participant was rewarded with 100 CZK for their participation. In total, 97 participants took part in the experiment. The baseline eye tracker data set, after data cleaning and removal of unreliable records, consisted of 76 participants ($N = 76$). This set was split into two groups, created by randomly displaying either a positively framed or a negatively framed message. This split created group A ($n = 34$), to which only the positively framed report was available, and group B ($n = 42$), to which only the negatively framed report was available. The data was processed using IBM SPSS Statistics software.

4 Results

4.1 Effect of page version on information recall

It was tested whether the version (positive, negative) of a message has an effect on the correct recall of information. For this test, a set of responses was available from a total of 97 participants who were randomly presented with either the positive or negative version. None of the participants had both versions of the displayed message, including the picture. What the participants remembered was verified by a short questionnaire with open responses. Participants did not know in advance that they would be asked about the content of the pages.

First, participants were asked to reproduce what was in the picture accompanying the text. Those who were shown the positive version of the website described the picture correctly 46% of the time (the rest described the picture incorrectly or could not clearly identify what they were describing; the answers included elements that were not in the pictures at all - e.g. benches, playgrounds); those who were shown the negative version of the website described the picture correctly (could be identified) less than 54% of the time. However, this difference was negatively tested for its statistical significance (p -value 0.48), i.e. the page version did not affect the correct reproduction of the image content. Similarly, what participants remembered from the text was examined. They were asked to briefly summarise its content or to state the meaning of the park revitalisation as described in the text. However, only general statements along the lines of "the revitalisation of the park is beneficial and will improve the city environment" were not considered to be a sufficient reproduction of the content of the text. Therefore, convincing responses were rated in less than 33% of cases overall (and individually in less than 37% of cases for participants with a positive version of the website and 30% of cases for participants with a negative version of the website). Whether the difference between participants with a positive version of the website and participants with a negative version of the website was statistically significant was tested with a chi-square test. The p -value of the test is 0.52, i.e., page version does not affect the recall of text content.

In the case of the quantitative data mentioned in the text and of which memorisation was also verified, the cost of park revitalisation, about 44% of participants who had the positive ver-

sion of the pages displayed correctly remembered the cost and about 39% of participants who had the negative version of the pages displayed correctly remembered the cost. Whether the difference was statistically significant was tested with a chi-square test, the p-value is 0.65, so at a 5% significance level we can say that the version of the site did not have an effect on remembering the cost of park revitalisation. Therefore, H1 was not confirmed.

4.2 Interest in "read more"

Participants were largely interested in learning more about the revitalisation of the park or clicked on the "read more" link in a large majority of cases (94% of participants clicked on "read more" in the positive version of the page, and less than 93% of participants clicked on "read more" in the negative version). It can be concluded that the input information was not sufficient for them, or it aroused their interest in learning more. This interest was not dependent on the positive or negative version (p-value 0.83), meaning that H2 was not confirmed.

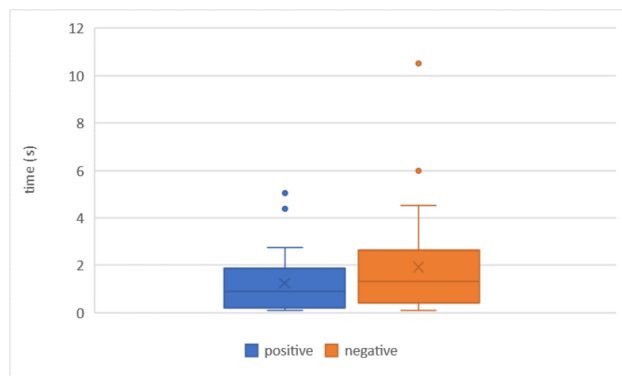


Fig. 3 Quartile distribution of image viewing times

4.3 Dependence of image viewing/text reading time on message version

It was tested whether the length of time participants spent viewing the displayed image depended on the different (positive/negative) framing of the image. The data obtained from the eye-tracking experiment was valid for 26 participants with a positively framed web page and for 32 participants with a negatively framed web page. The average image viewing time was 1.24 s (positive framing) and 1.93 s (negative framing), respectively. The boxplot (Fig. 4) below shows the quartile distribution of image viewing times.

The data was tested for normality of distribution, which was not confirmed. The non-parametric

Mann-Whitney test of two independent samples was chosen to test for dependence. At the 5% significance level, there was no dependence of the length of image viewing on the version of the web page viewed (p-value 0.211). Therefore, positive or negative framing in the case of image viewing length is not significant.

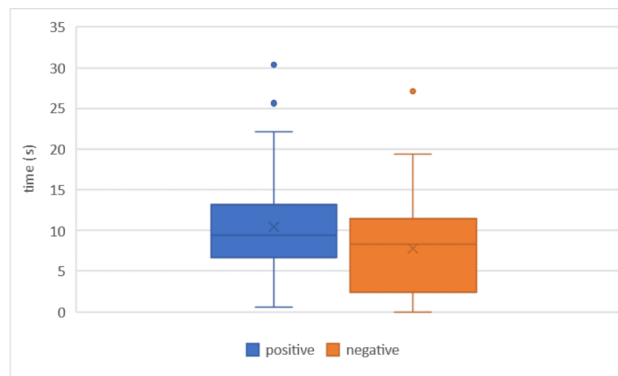


Fig. 4 Average time spent viewing/reading text

Similar to the case of image viewing length, text reading time was evaluated. The recorded text viewing/reading length time was valid for all participants in the baseline set (N = 76), the samples were A (n = 34), B (n = 42). The average time participants spent viewing/reading text was 10.45 s for group A and 8.00 s for group B (Fig. 5).

The two texts were not exactly the same length; the positively framed text was 194 words (1130 characters without spaces), the negatively framed text 187 words (1120 characters without spaces). We consider this difference to be negligible, so for further testing we consider the texts to be of equal length.

The data in both sets have a normal distribution, and a t-test for independent samples was chosen to test the dependence of the length of the text viewed/read on the positive/negative framing of the text. The variances of the sample data are the same (p-value of Levene's test is 0.939). The t-test statistic for equal variances for our test is 1.815, which is significant at $p = 0.74$. Different text framing affects the length of viewing/reading the text, indicating that H3 was confirmed.

4.4 Dependence of Time to first fixation on page version

Participants looked first at the text, which was placed on the left, with the accompanying image on the right next to the text.

The mean Time to first fixation of the text for the positive text was 0.78 s, and the mean Time

to first fixation for the negative text was 1.01 s. All participants' attention was directed to the text, or valid data is available for all participants with a positive version of the website (i.e. The data does not have a normal distribution, and a Mann-Whitney test was performed which did not show an effect of different website versions even in this case (5% significance level) (p-value 0.094)).

To test the dependence of Time to first fixation on positive/negative website version, data was valid for 24 participants with positive website framing and for 33 participants with negative website framing. The mean Time to first fixation of the image in the case of the positive image was 18.22 s, and the mean Time to first fixation for the negative image was 9.81 s. Such different mean times would suggest the existence of a dependence of the variable on the version of the image or web page. A test was conducted to verify this inference. The data of the two independent samples do not have a normal distribution, and a Mann-Whitney test was performed to verify dependence (Tab. 1). The test found no evidence at the 5% significance level of Time to first fixation dependence on the version of the web pages (p-value 0.121), which means that H4 was not confirmed.

Table 1 Mann-Whitney test for dependence of the time to first fixation on the positive/negative version of the message

variable	p-value
Total Fixation Duration-picture	0,211
Time to First Fixation-picture	0,121
Time to First Fixation-text	0,094

5 Discussion and conclusions

Local governments communicate with the public not only to fulfill their legal obligations, but also because it is desirable for them to have an informed public and to cooperate with them. Citizen participation is a standard tool of territorial governance and development, and only if it is based on information and awareness can it bring positive effects. It is therefore important for administrations to equip the public with information, i.e. to choose the appropriate communication channels, but also to make conscious decisions about the formulation and content of messages to the public. It is essential that the information that is communicated to the public is remembered by the public. Only in this way can this information enter

into the decision-making processes of individuals and ultimately be reflected in their attitudes and behaviour.

This study set out to explore whether the framing of messages - positive versus negative - impacts the effectiveness of communication from local governments to citizens, specifically in the context of information recall and visual attention. Despite the theoretical and empirical support for the idea that message framing can influence cognition and behaviour, our findings did not confirm these effects in the context of municipal website communication.

Contrary to Hypothesis 1, the framing of the message (positive or negative) did not significantly affect participants' recall of either textual or visual information. It did not show up in the memorisation of the text content nor in the correct recollection of the content of the accompanying picture. Despite the fact that a significant majority of all participants clicked on the "read more" element on the web page after reading the introductory information, they did not take on much of this additional information. The expectation that positively or negatively framed messages would differentially influence user engagement - measured here by the decision to click on a "read more" link - was not supported (H2). It is likely that participants merely skimmed the text without a deeper appreciation of its content. Eye tracking studies (Duggan & Payne 2011; Pernice et al. 2014) confirm that skimming is a common form of reading. A possible explanation for this behaviour is that the message was not relevant to participants' needs and was not useful to them (Mangen & van der Weel 2016; Singer & Alexander 2016).

Hypothesis 3 was confirmed: framing did have a significant effect on the time participants spent reading the accompanying text. Participants spent more time reading the positively framed message than the negatively framed one. This could reflect a subtle difference in how positive and negative content is processed cognitively. Prior research (e.g., Reber et al. 2004; Tang & Jang 2011) has suggested that positively framed information may be more fluently processed and elicit deeper engagement. However, this difference in processing time did not translate into better recall, suggesting a disconnect between engagement and retention in this context. In contrast, the time spent viewing the image (H3, visual component) and the time to first fixation on either the image or text (H4) did not significantly differ between positively and negatively framed versions. Although some variations in mean times were observed - such as the shorter time to first fixation on images in the negatively framed version - these

differences were not statistically significant. This suggests that the layout and design of the webpage may play a more decisive role in visual attention than the framing of content alone.

Furthermore, framing the message differently did not affect the time participants spent on both the text and the picture itself. Participants looked at the text first (this can be explained by its positioning on the left-hand side) and spent several times more time on it than on the picture (9.22 s on average for both versions). The average time devoted to the picture was about 1.6 s, which does not suggest that it was viewed more carefully. The picture was always associated with the text, and the short time participants devoted to it can be explained by the findings of e.g. Holmqvist & Wartenberg (2005) and Latini et al. (2020), i.e. that when text is interspersed with pictures, most readers pay most attention to the text and tend to skip the pictures. Overall, these results highlight a complex relationship between message framing, attention, and recall. While the framing of the message did influence reading time, it did not affect recall or engagement in a meaningful way. This raises important considerations for public administration: while efforts to craft emotionally resonant messages may influence how long a person spends reading them, such efforts may not necessarily enhance information retention or behavioural outcomes.

These findings also suggest that, in the context of public communication, content clarity, relevance, and perhaps design layout may be more critical factors than emotional framing alone. Future research could build on this by examining other message features, such as narrative structure, visual style, or interactivity, to determine their impact on comprehension and memory.

Finally, limitations of this study should be noted. The participant sample consisted mainly of university students, which may not reflect the broader public in terms of media consumption habits or cognitive processing styles. Additionally, the artificial setting of a lab experiment may differ from naturalistic settings where citizens engage with municipal websites amidst multiple distractions.

In conclusion, while framing remains an important concept in communication theory, our findings suggest that its practical influence on information recall in the context of municipal communication may be limited. Local governments should consider a broader set of design principles and user experience strategies to improve the effectiveness of their digital communication.

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