

Beyond the Narrative Visualization of Infographics on European Issues

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Abstract

The dynamic structure of infographics implies users' interactivity and engagement. The 'Debating Europe' platform, launched in 2011 and focused on a 'bottom-up' approach, has been using infographics in order "to illustrate key factors and to help explain complicated issues in an easily accessible way" (Debating Europe-Snapshot Report, 2014). Drawing on the infographics posted on the 'Debating Europe' platform, this study empirically explores the discourse-level of these visual images. We will consider infographics on European issues as visual-verbal texts that are socially constructed by the European Union to send its messages to EU citizens. Having social semiotics and appraisal theory as theoretical background, we will provide an insight into the potential navigation paths (information values, salience and framing) beyond these European infographics and into the use of the visual and verbal semiotic resources in the infographics on European issues.

Keywords: debating Europe, social semiotics, appraisal theory, navigation paths, graduation, attitude, engagement

1. Introduction

The emergence of new media and social media has brought two major shifts (Kress, 2003): (1) the move from the long dominance of writing to the new dominance of the image, and (2) the move from the dominance of the medium of the book to the dominance of the medium of the screen. Within this context, organizations want to inform and to appeal to citizens and consumers, and the visualization of data seems to enable viewers to gain insight and to make them understand the information quickly and efficiently (Lankow, Ritchie, & Crooks, 2012). In his book *The Power of Infographics*, Mark Smiciklas (2012) considers that visual learning is the final goal of the blending between data and design and infographics are the solutions of delivering complex information in a quicker and easier way. Considered visual displays which convey information, infographics (short for informational graphics) may range from a simple arrangement of figures to "stylized illustrations or to complex interactive data animations" (Lazard & Atkinson, 2015). Unlike visual technical reports or slide presentations which combine text and visuals, infographics are unified displays of these elements that are to be read on a single surface (Jones, 2015). Delight and utility are the two words associated with any visual information and consequently appeal, comprehension and retention are considered essential for the efficiency of verbal and visual communication (Lankow, Ritchie, & Crooks, 2012). The concise and systematic visual content and structure of infographics provide an increase of the speed of information comprehension, a better retention by activating viewers' visual working memory, and a greater impact upon a variety of audiences. Lankow, Ritchie, and Crooks (2012) claim that in the case of infographics produced for academic, business and scientific intelligence applications, the order of the visualization objectives changes. Since infographics should communicate information clearly and objectively, *comprehension* is the first priority, followed by *retention* and finally by *appeal*. Whether they are used for commercial or scientific reasons, infographics have been fueled by the rise of social media.

1.1 Infographics-visual Incentives on Debating Europe Platform

The calling to action of viewers is the ultimate explicit or implicit objective expressed in an infographic. Whether the action takes the form of buying a product/service, of civic participation to a social action or of taking part in a debate, organizations should visually illustrate the information which may urge the audiences to perform an action. This is the

reason for which infographics have also been used by public institutions which try to define problems, to determine causes, to engage citizens and to find solutions together. Online platforms have turned out to be a means of mobilizing and engaging citizens in various social, economic, or political issues. *Debating Europe* is such a European platform¹ whose main aim is “to connect European citizens and politicians in an online debate”.² Founded by the leading European think-tank, Friends of Europe, and the Europe’s World journal, *Debating Europe* was launched in 2011 and for five years it has been connecting (non)European citizens with policy makers and experts from across Europe on debating issues focused on six major channels (Future, Greener, Smarter, Quality, Global, Security). The format of each debate on this platform includes two main parts: (1) the input on a certain issue to be debated and the policy-makers and experts’ answers to some citizens’ comments, and (2) the citizens’ comments related to the respective issue and to the answers provided by the European policy-makers and experts. Thus the information provided in the beginning of the debate serves as an incentive for vivid arguments for or against an issue. Infographics are an important category on Debating Europe platform. Being the starting point of themed debate series, these infographics either define a problem or diagnose a cause which may have triggered severe consequences. Our study seeks to explore the visual discourse-level of the ‘Debating Europe’ infographics, the navigation paths and the meaning potentials of the visual and verbal appraisal resources.

1.2 Towards a Theoretical Framework on Infographics

1.2.1 Composition Meaning-possible Navigation Path Patterns

According to Edward Tufte (2001), analytical designs show comparisons, contrasts, differences, causality, explanation, and systemic structure. These principles identified by Tufte actually reflect what E. Segel and J. Heer (2010) label as central to the definition of a narrative, namely “the notion of a chain of causality related events”. Sequentiality is essential in any narrative because it provides the order of events by establishing the connections between them. For infographic design, a narrative approach, which is illustrative and design-focused, will seek “to guide the viewers through a selected set of information data that tells a story” (Lankow, Ritchie, & Crooks, 2012). In the article *Narrative Visualization: Telling Stories with Data*, E. Segel and J. Heer (2010) claim that the organization of the design space contains two important divisions: visual narrative tactics and narrative structure tactics. Within the former division, the two authors include three sections: visual structuring (mechanisms used to communicate the overall structure of the narrative), highlighting (mechanisms used to direct the viewer’s attention to particular elements in display) and transition guidance (techniques used for moving within or between visual scenes). The authors divide the latter division into three sections: ordering (ways of arranging the path viewers may take through the visualization process), interactivity (viewers’ ways of manipulating the visualization) and messaging (ways a visualization communicates issues to viewers).

The short text fields (labels, captions, headlines, annotations), the more substantial descriptions (articles, introductions, summaries) or the visual images (charts, bars, pies, icons) that Segel and Heer include in the division of messaging, coincide with what Kress and van Leeuwen (2006) identify as semiotic resources. Unlike structural semiotics which studies signs, social semiotics investigates how semiotic resources are used in “specific historical, cultural, and institutional contexts” (Van Leeuwen, 2005). Placing an emphasis on context-bound and conflict-laden interpersonal interactions (Vannini, 2007), the representatives of social semiotics follow Halliday’s definition of a signifying system (2004), namely as a resource of making meaning rather than as a set of rules. This is the reason for which in social semiotics we may talk about a meaning potential. Social semiotics provides resources with a twofold potential: a theoretical semiotic potential (past and potential future uses) and an actual semiotic potential (uses known by specific users with specific needs in specific contexts). Although Jacques Bertin (1967) did not mention the term “semiotic resources”, he acknowledges in his book *The Semiology of Graphics* that alternate interpretations to graphics as sets of signs should not be considered failures, but rather possible readings. Besides semiotic resources which act as represented participants in infographics, compositional meaning is also important in such visual representations. In our study we will adopt the notion of compositional meaning as it is presented in social semiotics. G. Kress and Theo van Leeuwen (2006) identify three main interrelated components of the composition meaning: *information value and structure*, *salience* and *framing*. The placement of resources in a composition is essential for the information value and structure of the semiotic space. The viewer will interpret the composition taking into account the placement of objects on the left or right, in the centre or the margin, or in the upper or the lower part of the image space. Thus the arrangement of resources will provide three separate dimensions (Kress, van Leeuwen, 2006): the vertical dimension (general information to be found at the top, specific information to be found at the bottom), the horizontal dimension (‘given’ information on the left and ‘new’ information on the right) and the dimension centre-margin (most important information in the centre and less important information at the periphery of the picture space). The *salience* component deals with making some elements more eye-catching than others. Size, colour contrasts, tonal contrasts, foregrounding or backgrounding, differences in sharpness of focus are visual means through which resources may be made more

salient than others. The ‘framing’ component deals with the layout of the resources within the picture space and it shows that the elements of composition may be depicted as separate entities (dividing lines) or as belonging together (connecting lines).

Following Kress and Van Leeuwen (1996)’s assumptions about viewers’ preferences, Jana Holsanova and Kenneth Holmqvist (2006, p. 71) extracted several general assumptions about the visual reading behavior. In our analysis of the compositional meaning of the infographics on European issues we will start from the following five assumptions in order to highlight the possible navigation path patterns used in the visual framing of European issues:

1. Viewers prefer new information and expect this to be on the right in the semiotic space.
2. Viewers prefer the most general information at the top and the most specific information at the bottom of the semiotic space.
3. Viewers look for the most important information in the centre of the page and less important information on the periphery.
4. Viewers look for graphically salient elements.
5. Viewers follow elements connected to each other by framing devices such as lines and arrows.

1.2.2 Visual Appraisal Framework

Starting from Martin and White’s appraisal theory (2005), which was developed within the framework of systemic functional linguistics (SFL), D. Economou (2009) adapted the three verbal appraisal resources (attitude, engagement, graduation) for the analysis of visual appraisal in news photos.

Visual *attitude* can be either inscribed (explicit attitude) or evoked (implicit attitude) through three subcategories: *affect*, *judgment*, *appreciation*. *Affect* can be inscribed in the visual topography of facial expressions and body gestures (Economou, 2009) of depicted participants, expressing un/happiness (sad/happy), insecurity (afraid) and dissatisfaction (angry).

Judgment may be distinguished between social esteem and social sanction. Within social esteem, there are three subcategories: normality (how usual or exceptional people are), capacity (how capable people are), and tenacity (how determined people are). Social sanction includes veracity (honesty) and moral propriety (moral/legal codes to be used in the judgment of behavior).

Appreciation deals with three subcategories: reaction (impact and quality), composition (balance and complexity), and valuation (worth and value). In news photos affect is the only regularly subcategory inscribed (Economou, 2009), whereas in cartoons, all three types of attitude can be visually inscribed and evoked (Swain, 2012). The predominance of a visual attitude subcategory is clearly genre and theme dependent. For example, Cheung’s study (2016) on infographics shows that the *judgment* and *appreciation* values are surprisingly prominent. The negative normality is visually used to define a particular situation and the negative propriety is used to provide a moral evaluation to some negative-laden actions.

Visual engagement involves resources of dialogistic positioning towards an issue. Although D. Economou (2009) does not adopt Martin and White’s distinction between monogloss and heretogloss as subtypes of engagement, we consider that these two resources are important since other viewpoints besides the authorial subjectivity may be present in infographics. Within the monogloss type of visual engagement, we may find *proclaim* (the authorial voice represents the situation as warrantable) and *disclaim* (the authorial voice rejects the situation depicted). The heterogloss type of visual engagement includes *attribute* (attribution of attitude to depicted participants) and *entertain* (the illustration of alternative positions to a situation depicted). D. Economou (2009) adds the category of *suggest* which entails allusion to some other visual style (photos, art).

As Martin and White (2005) suggest, “*attitude* and *engagement* are domains of graduation which differ according to the nature of the meanings being scaled”. Force and focus are the two resources used in gradability. Under force, we may find *visual quantification* (*number* and *mass* of items, *extend – proximity* – distance of the item from viewer, *extend – distribution* – the space occupied by the item), *visual intensification* (*brightness* of the item-light versus dark; *vividness* of color) and *visual repetition* (recurrent items). Under focus, we may have *visual specification* with three resources: *clarity* (degree of detail, distinction from other objects), *substantiation* (degree of depth and dimensionality) and *completion* (camera angle). As observed, the appraisal resource of visual graduation coincides with the three elements of the compositional meaning from social semiotics. *Extend* through the distribution of items (semiotic resources) shows the information value and structure, while the visual quantification through number, mass and the visual specification through clarity and substantiation show the salience of semiotic resources.

Following Kress and Van Leeuwen’s assumptions about the reading behavior and Martin and White’s claim that attitude

and engagement are domains of graduation, we consider that in infographics, visual graduation as an appraisal resource is more visible than the appraisal resource of attitude which is mainly evoked. At the same time, we consider that the graduation values (high, median, low) intensify the other two appraisal resources. This is the reason for which in our analysis of the infographics on European issues we will start from an insight into the visual graduation, then into visual engagement and visual attitude.

2. Corpus, Method, Research Questions

It has been found that visualizations are among the most useful methods of communication in various domains (Ansari & Riase, 2016). Infographics are among the most widely used visualizations in real life. The infographics³ of the present study were used on the 'Debating Europe' platform as visual incentives to trigger debaters' comments on nine sensitive issue (Appendix): immigration in the EU ('Europe's Refugee Crisis'—Figure 1), climate change ('Climate change'—Figure 2), entrepreneurship in the EU ('Europe & Entrepreneurship'—Figure 3), arguments for and against gay marriage ('Same-Sex Couples and Civil Rights in the EU'—Figure 4), green Europe ('Air Quality'—Figure 5), youth unemployment ('Europe's LOST generation'—Figure 6), health in Europe ('Health in the EU'—Figure 7), gender equality ('Gender Equality'—Figure 8) and arguments for and against Catalonia independence ('Catalonia Independence' - Figure 9).

We will employ a qualitative content analysis of the nine infographics in order to find possible navigation paths of informational graphics on European issues and the meaning potentials of the visual and verbal appraisal resources. We did not perform a quantitative analysis of the appraisal resources because as we mentioned above, beyond any visual graduation resource there lies some visual attitude or/ and engagement. For example, the depiction in the black colour of persons bending over or kneeling when illustrating the refugee crisis does not only have high [intensification: brightness], but also it evokes [affect: sadness]. So the purpose of our analysis was to find a pattern of navigation paths and of visual appraisal resources, but not without highlighting the exceptions to these patterns.

Following Holsanova and Holmqvist's assumptions about the visual reading behavior and Economou's visual appraisal framework, we structured our study on the following research questions:

RQ1: How is information placement obtained?

RQ2: Which (visual and verbal) semiotic resources are more salient?

RQ3: What framing devices are used throughout the composition of the infographics?

RQ4: Which of the two (visual and/or verbal) semiotic resources are used as having high [quantification: mass], [intensification: vividness, brightness]?

RQ5: Which type(s) of visual and verbal engagement prevail in the infographics under analysis?

RQ6: Which values (positive or negative) are dominant in the appraisal resource of visual and verbal attitude inscribed in the infographics?

3. Results

3.1 Patterns of Navigation Paths of Infographics

Since infographics are made of various verbal and visual resources, we assume that readers follow what Kress and van Leeuwen (2006) identify as the 'most plausible reading path'. Thus readers are thought to glance at the infographics, and then make a new start from left to right, from the title of the infographic to visual elements, after which they will move to the body of the verbal text. As the first glance at an image which contains various semiotic resources, is important, we consider that the placement of information is achieved through eye-catching visual and/or verbal illustrations and that these will constitute the starting point of a plausible navigation path in infographics. Thus the salience of graphic elements will play a significant role and readers will look for visual/verbal resources which are different in size, colour, or tonal contrasts. If all resources are equal in terms of salience, readers may start their navigation path from the center of the infographic. Another important aspect that should be mentioned about the compositional meaning of an infographic is that, just like a newspaper spread, the visual and verbal information is presented under the form of clear delimited items which may be either clearly divided or connected through framing devices (lines, arrows having distinct colour, weight, or style etc.).

To answer the first research question (RQ1) about the information placement, we tried to analyse the graphical representation of the information arrangement within the structure of the nine EU infographics (Appendix). As observed, the most dominant arrangement of the information value in EU infographics is the horizontal placement of two (Figures 3, 7, 9), three (Figures 1, 2, 4, 5) or foremost four (Figures 6, 8) layers of verbal and/visual resources. As a general pattern, the titles of the infographics are placed at the topmost and the viewers follow, in most cases, a top-down reading navigation path.

The vertical arrangement of information is present when the infographics provide a thorough overview over the chronology of events, as it is the case of the refugee crisis (Figure 1), or over the pros and cons for a debated issue, as it is the case of Catalonia independence (Figure 9). This vertical distribution of events and arguments has a left-right structure where the two visual fields are divided by a central vertical axis where years or visual items are inserted. In these cases of vertical arrangement of refugee crisis chronological development and of the arguments for or against the Catalonia independence, a zig-zag navigation path pattern, made up of a series of z-movements, is salient.

Although it is not as salient as the horizontal placement, the center-margin structure is also present in two infographics (Figures 4, 5). This structure provides that the nucleus of the infographics is the year when the same-sex marriage was legalized (Figure 4) or the owl announcing the number of premature deaths in the EU (Figure 5). The surrounding elements, placed at the top and down parts of the infographs, allow viewers to discover specific issues related either to the situation of gay marriages in Europe or to the alarming effects of air quality and the benefits of reducing sulphur in fuels.

The starting point of the second research question (RQ2) was one of Holsanova and Holmqvist's general assumptions about the viewers' reading behavior. The researchers assume that viewers look for graphically salient elements as points of departure in their visual reading. The mostly frequent ways of making visual and verbal elements salient in the infographics under analysis were colour and tonal contrasts. Various levels of saturation of blue were used in all infographics and this color was combined with black (Figures 1, 6), red (Figure 2), yellow (Figures 7, 9) and violet (Figures 4, 8). The meaning potentials of these colour combinations will be explained in 3.2. Size as a factor of salience was used only in four infographics (Figures 4, 6, 7, 8). The visual elements which were oversized compared to other elements were figure shapes and the map of Europe. In the infographic about the gay marriages, the map of Europe pinpointed by red and violet hearts shows the widespread distribution of same-sex civil unions and marriages. In the other three infographics, the oversized figure shapes are used to show either one alarming issue (obesity in the US and in the EU) or the increasing empowerment of women (women at work). Besides the salience of the visual elements, through size and colours, numbers (years, percentages etc.) were also made salient, especially through size. We do consider that some viewers may start their reading navigation path from these numbers which, in most cases, are combined with visual salient elements in order to be more eye-catching. For example, the infographic on air quality (Figure 5) may have two starting points for reading: either from the oversized percentage (80%) placed on an oversaturated black cloud at the top left of the infographic or from the oversized number of premature deaths (420,000), placed under the center of infographic.

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The visual engagement through salient elements should be closely connected to clear and precise data visualization. Framing devices play a significant role in the distribution of these data (RQ3). In the nine infographs under analysis, the dividing frames are mostly used under the form of white spaces as boundaries. Two other framing devices are present and they are used to highlight the evolution of certain events: blue ribbons – to present the chronological development of gay marriages in Europe and blue and black rectangulars – to show the evolution of the refugee crisis by year and by days.

3.2 Appraisal Analysis of Visual and Verbal Semiotic Resources

As mentioned above, the appraisal category of graduation is the starting point in this analysis since its meaning potential is closely connected to the appraisal categories of engagement and attitude. Thus we will not answer the last three research questions in turn, but rather we will provide an appraisal analysis to the visual framings of four European issues illustrated in the infographics under analysis: (de/re)bordering, health, gender and youth issues.

3.2.1 The Narrative Visualization of (De/Re) Bordering Issues

Immigration flows, increased diversity of societies and cultures or independence movements have been challenging phenomena for the European Union. Two of the infographics under analysis deal with the issue of the refugee crisis (Figure 1) and of the Catalonia Independence (Figure 9), the latter infographic triggering the highest citizens' mobilization: this infographic was the most appreciated (1000 likes) on the 'Debating Europe' platform.

Both infographics display the same structure formed of horizontal layer(s) at the top and a vertical layer with multiple sub-layers. Information about the current situation of refugees and migrants and about the chronology of the Catalanian issue is presented within the horizontal layer. Besides the defining of the problem (number of refugees crossing to Europe, number of deaths, aspects of Catalonia autonomy), both infographics provide a causal interpretation for these

current situations: on the one hand, civil and ethnic wars and poverty, on the other hand, Franco dictatorship. The content of the vertical layer is different. Whereas the infographic on the refugee crisis provides an insight into the sequentiality of events (2013-2015) embedding 14 stages, the infographic on Catalonia independence gives a comparative overview on the pros and cons of such action, embedding three sub-layers.

Although they have the same composition structure of the information value, there are differences at the level of the salience of visual and verbal items. This is the reason for which we will analyse each infographic in turn.

Compared to the verbal resources depicting the refugee crisis (Figure 1), the visual items are not intensified by high force [quantification: number, mass], but rather by [brightness and vividness]. The vivid colours of yellow, red and blue (of the life jacket, of the life buoy and of the sea) make a high contrast with the black colour of the dividing framing devices. Since the life buoy and jacket are placed next to the verbal texts announcing two operations for preventing refugees from drowning, they afford positive values of [social esteem: capacity], highlighting the Italian launching of the 'Mare Nostrum' naval and air operation, which stopped one year later (negative social esteem: capacity), and the EU 'Triton' border security operation.

Unlike visual resources, the verbal resources have a high force of quantification through distribution and mass. This verbal graduation is obtained through the semiotic mode of typography (van Leeuwen, 2006). The bold weight and the uppercase of oversized letters and numbers are meant to visually highlight the stages of the refugee crisis and its impact in terms of casualties. The visual resources (human figures, candles and RIP stones) seem to amplify the meaning potential of the verbal resources because together they evoke a negative [social esteem: normality] and a negative attitude in viewers, emphasizing either sadness (the bending position of the three beings) or compassion and sympathy towards these refugee crisis victims.

The appraisal resource of engagement is obtained through verbal resources. Besides a monogloss engagement through verbal resources signifying more disclaim ("discarded", "died", "drown", "close its borders", "no result") than proclaim ("initiative", "proposal"), there are various instances of heterogloss engagement. The exact numbers of the refugee casualties actually reflect that in the making of the infographic various sources were used. Mentioned at the bottom left of the infographic, these European authority sources seem reliable social actors which contribute to the negative normality mentioned above. Besides this appraisal resource common to all EU infographics under analysis, this image embeds five European officials as political actors (Austrian Interior Minister, EU Interior and Foreign Affairs Minister, Italian Prime Minister, UNHCR's Europe Bureau, EU Council President) involved in handling the refugee crisis. Their direct or indirect verbal quotes have the meaning potential of judgment and attitude values. Evoking negative [social sanction: propriety], negative [social esteem: tenacity and capacity] and dissatisfaction, Matteo Renzi (Italian PM) and Vicent Cochetel (head of UNHCR's Europe Bureau) use the polarization discursive strategy to criticize the lack of solidarity towards the refugees compared to the involvement towards the victims in the Charlie Hebdo attack and the lack of will and courage to implement the refugee policy in Europe.

The visual resources used in the representation of the Catalan independence seem to be more eye-catching than the verbal resources. Through high force [quantification: mass] and [intensification: vividness] of the red and yellow colors, the ten visual items have an anchoring meaning (Barthes, 1977) for the three arguments against and for the Catalan independence. For example, the image of a Pandora's box is used as a con and is related to the argument 'Balkanisation of Europe', whereas the image of a bull with an X sign on it is used as a pro for the argument 'Catalonia is not Spain'.

Unlike the infographic on the refugee crisis, this infographic provides a visual engagement through heterogloss which is obtained either by the use of charts issued by European institutions or by intertextual items, such as the bull, a football player's boots and ball or the flag. The use of these well-known cultural icons of Spain and of Catalonia is meant to evoke either a positive [social sanction: veracity], Catalonia has its own flag, both Spanish and Catalan people have "a passion for football", or a negative [social sanction: veracity], the Catalans have banned "bullfighting as cruel and barbaric". Compared to the previous infographic, the verbal engagement through monogloss is more frequently used. The six verbal texts embed words either proclaiming the independence ("part of a distinct, proud nation", "own language, culture, history, flag", "to take control of its finances", "a clear majority of Catalans who want independence –up to 57%", "a monarchy for whom they have little affection") or disclaiming this independence movement ("dangerous potential for conflict", "debt to the tune of € 42 billion", "selfish economic nationalism", the risk of "isolated monoculturalism"), thus triggering a polarization: positive versus negative [social sanction: propriety].

3.2.2 The Narrative Visualization of Health Issues

Three infographics deal with various aspects of health: the current situation of the environmental impact of global warming (Figure 2), the consequences of pollution upon life expectancy (Figure 5) and a country comparison about the health status, obesity, medicine consumption and smoking (Figure 7). The composition value is differently assigned in the three infographics. Whereas three horizontal layers are used for the structure of infographics on the themes of

climate change (Figure 2) and air quality (Figure 5), the structure of the infographic on health in the EU (Figure 7) is made of a horizontal layer and a vertical layer, embedding four sub-layers.

Blending the definition of the problem with the attribution of responsibility, the top and the middle horizontal layers in Figures 2 and 5 inscribe negative [social sanction: veracity]. The data visualization through the use of bold typography for numbers and high force [intensification: vividness] of the red, black and blue colors evoke negative [social sanction: propriety], on the one hand, condemning the high impact of air pollution and emissions, and on the other hand, inducing an alarming state. The graphic representation of the global share of CO₂ emissions per country (Figure 2) is just an example of shifting blame to various countries responsible for global warming: China (29%) or US (16%). The verbal and visual resources inserted in the last horizontal layer inscribe a positive [social sanction: propriety], praising the effects of the EU legislation implementation of the reduction of sulphur in fuels in 20 cities (Figure 5) or the future benefits of reducing emissions (Figure 2). The polarized large versus low force [quantification: number] of the two piles of coins, together with the piggy bank in Figure 2, evoke positive [social sanction: propriety] and hope in finding the proper solutions to stop the possible effects of global warming. Whereas the meaning potential of the visual resources used in Figure 2 matches the interpretation of the decreasing numbers, one can notice a contrast in the meaning potential of the visual and verbal resources used in Figure 5. Although the facial expression of the human figure placed at the bottom of the infographic on pollution may evoke fear and insecurity, the typography of the verbal resources (numbers and sentences using past reference) marked in blue seems to bring positive [social esteem: normality and capacity] through the already implemented measures of the EU legislation in 20 cities which triggered the prevention of 2,200 premature deaths and the saving of 192 million euro.

Unlike the other two infographics where numbers have a higher force [quantification: mass], in Figure 7 this appraisal resource of quantification through mass is assigned to a human figure, placed on the right part of the infographic, which through its oversize inscribes negative [social sanction: veracity] of an alarming problem, namely obesity. The chart inserted within this human figure illustrates through comparison the body mass index in the US, the EU-27, and Africa. The high force [visual intensification: vividness] of the column charts highlights that obesity is more widespread in the US. Actually the comparison among the EU-27 is the dominant visual narrative strategy through which health status, life expectancy, medicine consumption and smoking are illustrated. The meaning potential of this polarization (good-bad) is to evoke a dichotomy between positive and negative [social sanction: propriety]. Although this infographic does not provide any solutions as the other two previous infographics did, the countries mentioned within the 'good' polarization pole may serve as best practices to be followed.

Whereas in the visual representation of the refugee crisis the visual engagement through heterogloss was achieved through verbal quotes from various European officials, in the infographic of the health status (Figure 7), the strategy of intertextuality is used to visually illustrate the state one may reach if he/she is healthy. Instantiating the external context of Buddha in a lotus position during meditation, the viewers are invited to assign a positive [social sanction: propriety] to this practice which may provide proper breathing and physical stability. The placement of this visual intertext in the center of the chart on health status in EU-27 implicitly evokes that the citizens from the countries placed on the yellow circle (Greece, Cyprus, Sweden) may have embraced this type of practice, whereas the citizens from the countries placed on the red circle (Portugal, Hungary, Lithuania) did not.

3.2.3 The Narrative Visualization of Gender Issues

Gender equality and same sex couples and civil rights in the EU are the themes related to gender issues in two infographics (Figures 4 & 8). In both information graphics the top and the down horizontal layers have a high [quantification: extend: distribution] as they fill most of the image. The difference lies at the way in which the information value is structured in the middle of both infographics. Whereas the infographic on same sex couples embeds a distinctive center which is visually framed through a blue ribbon, the infographic on gender equality has two other medium horizontal layers in the middle of the image.

The appraisal resource of visual graduation through high [intensification: vividness] of the violet and red colours is used in both infographics to highlight the acceptance rate of same sex marriage and same-sex civil unions in various European Countries (Figure 4) and the evolution of European directives related to sex discrimination (Figure 8). The visual force of repetition of red and violet hearts pinpointing various countries on the map of Europe is present in order to clearly present those countries which adopted same-sex civil unions (red hearts – 14 countries) and same sex marriages (violet hearts – 7 countries). These visual items inscribe positive [judgment: social esteem: capacity] for those countries where these types of marriage and civil unions are possible and, at the same time, they evoke an attitude value for viewers though positive appreciation and positive [judgment: social sanction: propriety]. The same colour violet is used in the horizontal layer of the gender equality infographic. The oversized upward directed sex symbol for females encircled in violet rectangulars containing years is eye-catching and it inscribes positive [judgment: social esteem:

capacity] of the European Union to deal with the issue of sex discrimination throughout years (1957-2012). The outcomes of the EU directives on gender equality are presented in the lower horizontal layers through high force [quantification: mass] of percentages (e.g. 45% employed women – EU-27, 2014 or 16.2% average gender pay gap EU-27, 2010). Employment rate and gender pay gap are visually presented through contrast between countries with high versus low rates (e.g., Estonia – largest pay gap – 27.7% versus Slovenia – smallest pay gap – 0.9%), which may evoke the polarization positive versus negative appreciation, [judgment: social esteem: capacity] and [judgment: social sanction: propriety]. The horizontal layer at the bottom the infographic on gender equality may be interpreted as the consequences of the EU solutions taken to stop sex discrimination. The three women depicted in high force [quantification: mass] of their figure shape and [intensification: vividness] of the violet colour inscribe positive [social esteem: capacity and normality] of women in three work sectors: technology (30%), large corporations (13.2% - on the boards of the largest companies) and politics (35% MEPs in the EU parliament).

Visual force of quantification of mass of numbers is also used in the bottom horizontal layer of the infographic on same-sex couples and civil rights in the EU (17,000 people entering into same-sex marriage in Belgium between 2003-2010 or more than 1,100 children living with same-sex parents in Sweden in 2010). As mentioned above, the meaning potential of these numbers is to highlight a positive [judgment: social esteem: capacity and normality] in some EU countries (Belgium, Spain, Sweden, the Netherlands) regarding this issue. The left versus right structure within the bottom horizontal layer clearly presents the bias situation which this issue may trigger: on the one hand, in the left subfield, the viewers see two stalks bringing babies in two countries, whose meaning potential is positive [judgment: social esteem: capacity and normality], on the other hand, in the right subfield, the viewers see the visual and verbal engagement of David Cameron and the Pope Francis who explicitly condemn these types of marriages and civil unions. Visual force of intensification through brightness of the black colour (high saturation of black for storks versus low saturation for oversized quotation marks) is used to show this polarized issue of same sex marriages. Verbally framing same sex couples as “weakening” marriage (David Cameron) and as “an attempt to destroy God’s plan” (Pope Francis), the UK Prime Minister and the Pope overtly blame this kind of social practice and their verbal quotes explicitly may afford negative values of [social sanction: propriety] for same sex couples.

3.2.4 The Narrative Visualization of Youth Issues

The last two infographics under analysis present two issues facing the European youth nowadays: entrepreneurship (Figure 3) and unemployment (Figure 6). Horizontal layering (two or four layers) is the dominant distribution of information value in both infographics. Charts with percentages play a significant role (high force [quantification: extend: distribution]) in the visual framing of what is considered to be Europe’s lost generation. Besides the affordance of negative values of [social esteem: normality], these numbers may evoke either negative or positive [social sanction: propriety]. Comparison and causation are the two principles used in the infographic on entrepreneurship (Figure 3) to present either a decrease of EU citizens’ desire to be self-employed or a lack of involvement in starting one’s own business, thus evoking negative judgment values of propriety. The infographic on youth unemployment implicitly evokes, through comparison, a clear polarization between positive versus negative values of [social esteem: capacity] and of [social sanction: propriety]. On the one hand, there are praised those countries which succeeded in having a low rate of unemployment (Austria, Germany or the Netherlands) or in convincing their citizens to start a business (Cyprus, Bulgaria or Greece) and, on the other hand, there are condemned those countries with a high rate of unemployment (Spain, Greece or Italy) or with citizens who have not tried to become self-employed (France, Belgium or Slovenia). An implied causality is shown between education and unemployment. The three percentages (30.3%, 20%, 17.9%) may afford a negative valuation for the correlation between primary or lower secondary education and lack of employment.

4. Discussion and Conclusion

Comprehension, retention and appeal are the three visualization objectives (Lankow, Ritchie, & Crooks, 2012) that an infographic should have in order to be effective. Designed to communicate information clearly and objectively, infographics should embed those verbal and visual resources which should be enough eye-catching to enrich viewers’ knowledge on various issues and ultimately to make them take action. The ‘Debating Europe’ platform has been using infographics as debate incentives for four main issues significant to European citizens: (de/re)bordering, health, gender and youth issues. The content analysis of the nine infographics posted on this platform shows that there could be inferred a pattern of narrative visualization when visually presenting European issues. Such a pattern should focus on two major aspects: (a) navigation paths and (b) the use of graduation, engagement and attitude as appraisal resources in the depicting of European realities.

The study of the nine EU infographics shows that the designers followed two main visual reading assumptions, namely that viewers look for graphically salient elements and that they follow elements connected to each other by framing devices. Thus the first navigation path may start from the most salient visual and/or verbal elements and since in most

cases the title of the infographic, placed at the top, is salient enough or is written in contrasting colors to catch the viewer's eye, the reading path is a top-down one. The same navigation path is provided by the layering of information about the European issues. As observed, the horizontal layering is the most dominant placement of information value, each layer being connected through various framing devices (white spaces, rectangles or ribbons). The second navigation path is a zig-zag reading path, made up of a series of z-movements. Within this second pattern, the vertical layering of information is dominant and it is used in two cases: to present a certain chain of causality related events (the 14 stages of the refugee crisis) and to highlight the contrasting arguments for or against the Catalan independence.

The appraisal resource of graduation is closely connected to the assumption that viewers look for graphically salient items while reading an image. The analysis showed that numbers, charts and human figures are given high force through visual quantification of mass (the space occupied by the verbal or/and visual items) and through visual intensification of color vividness (various hues of blue contrasted with black, red or yellow). Since information, whether it is given high, medium or low force, needs to have an issuing source and needs to evoke some emotional reaction, this appraisal resource of graduation intensifies engagement and attitude.

Heterog loss is the dominant type of engagement in the EU infographics, used either as verbal quotes of European officials or as factual information issued by authorized sources (e.g., European Commission, Stern report, Environmental Assessment Agency or Eurostat). These factual claims, mainly presented under the form of statistics and through comparisons, are meant to increase attention and to provide greater understanding about a particular state of affairs. Their meaning potential is to inscribe negative or positive values of [social esteem: normality], by highlighting the present situation of an issue in a European country. This (ab) normality is implicitly linked to the (in) capacity of a member state country to deal with that problem. Most of the EU infographics illustrate verbal and visual comparisons through polarizations, either of measures well or badly implemented in European countries or of possible or already achieved consequences if certain solutions are taken. The meaning potentials of these good versus evil polarizations are to evoke either appreciation and satisfaction (positive judgment: propriety) or low esteem and condemnation (negative judgment: propriety).

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Notes

Note 1. <http://www.debatingeurope.eu/>

Note 2. <http://www.debatingeurope.eu/hello/>

Note 3. <http://www.debatingeurope.eu/focus-list/infographics/>

Appendix



Figure 1. Europe's Refugee Crisis
 (<http://www.debatingeurope.eu/focus/immigration/#.V6RcN6IqnIU>)

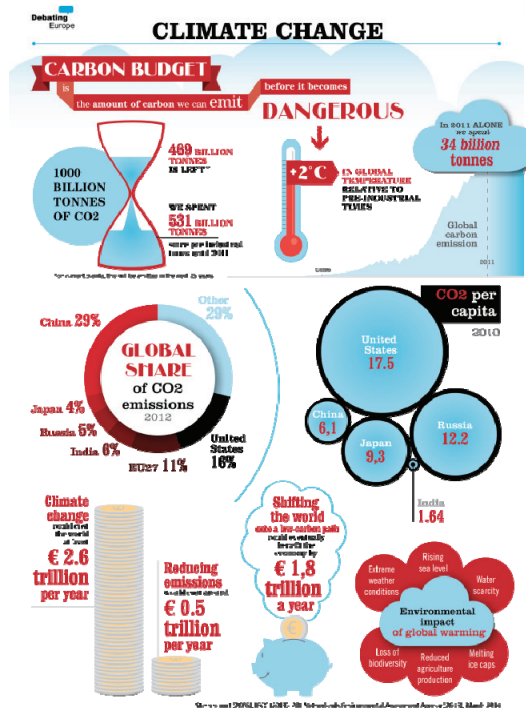


Figure 2. Climate change
 (<http://www.debatingeurope.eu/focus/climate-change/#.V6RcT6IqnIU>)

EUROPE & ENTREPRENEURSHIP

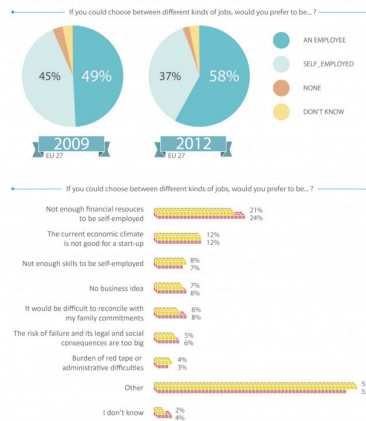


Figure 3. Europe & Entrepreneurship

(<http://www.debatingeurope.eu/focus/entrepreneurship-in-the-eu/#.V6RcYqIqnIU>)

SAME-SEX COUPLES AND CIVIL RIGHTS IN THE EU

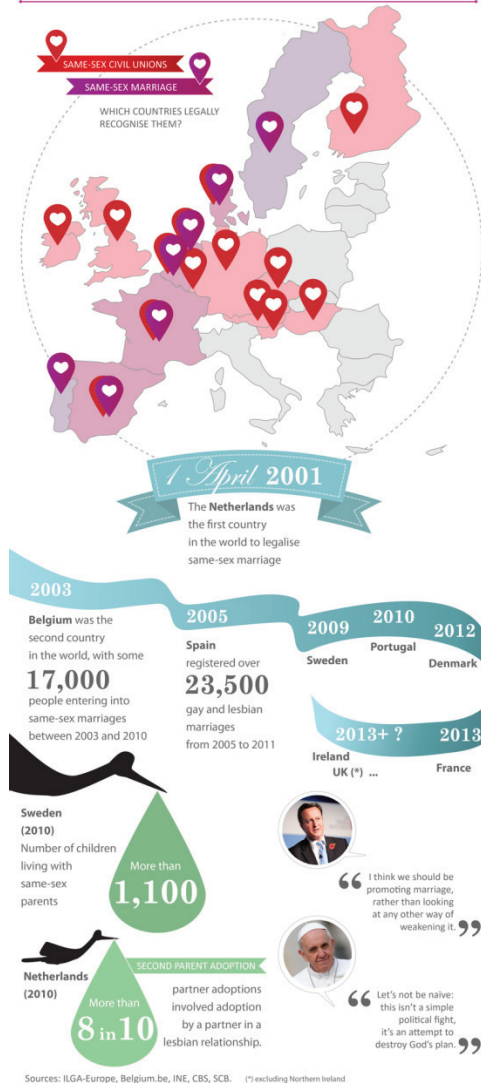


Figure 4. Same-Sex Couples and Civil Rights in the EU

(<http://www.debatingeurope.eu/focus/arguments-for-and-against-gay-marriage/#.V6Rcb6IqnIU>)

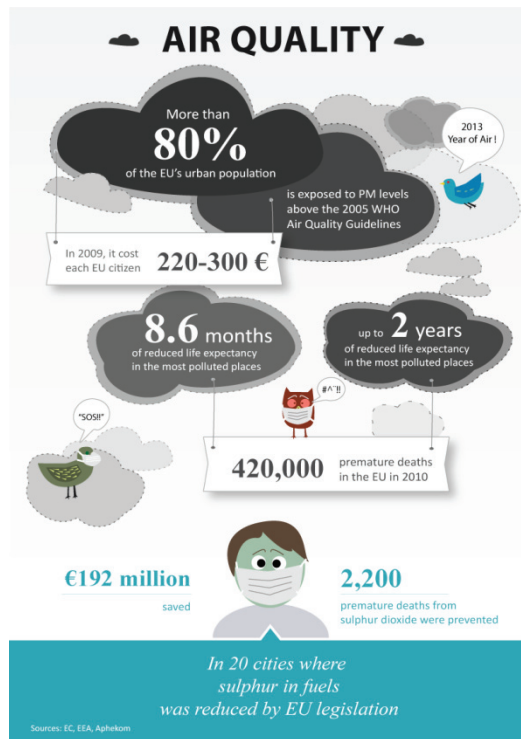


Figure 5. Air Quality

(<http://www.debatingeurope.eu/focus/green-europe-themed-week/#.V6RcgqIqnIU>)

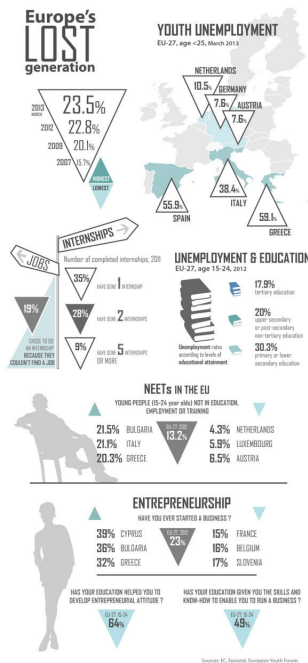


Figure 6. Europe's LOST generation

(<http://www.debatingeurope.eu/focus/youth-unemployment-themed-week/#.V6RclaiqnIU>)

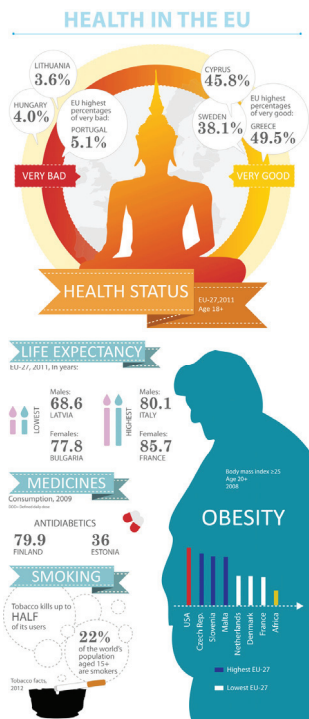


Figure 7. Health in the EU

(<http://www.debatingeurope.eu/focus/health-in-the-eu-themed-week/#.V6Rcp6IqnIU>)

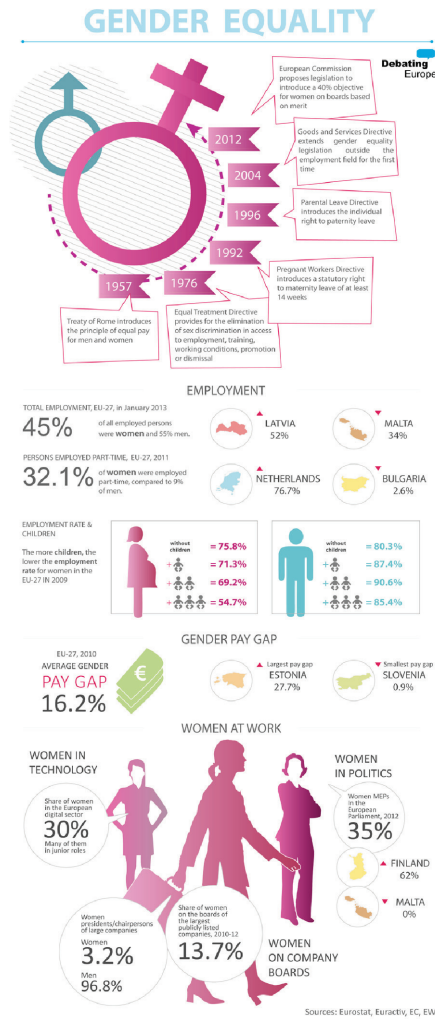


Figure 8. Gender Equality

(<http://www.debatingeurope.eu/focus/gender-equality-themed-week/#.V6RcwaIqnIU>)

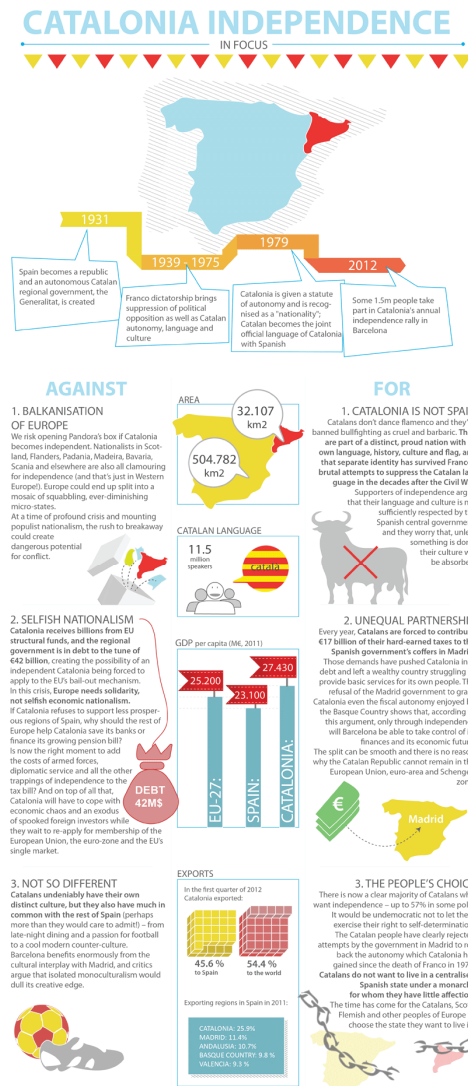


Figure 9. Catalonia Independence

(<http://www.debatingeurope.eu/focus/independence-catalonia/#.V6Rcz6IqnIU>)



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