



TRACKING MULTIMODAL LITERACY IN SCHOOLS: A CASE STUDY

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Abstract/Izveček

This paper presents tools which can be used to measure multimodal literacy and metasemiotic awareness in students. The results are interesting within the context of multiliteracy development both in terms of the individual student over time or in comparison to other students within a specific course, as well as when comparing data from larger cohorts for example differences in level or orientation of education, age, regional, territorial, national and so on to see patterns or strengths and weaknesses in multimodal literacy within a wider perspective.

Ključne besede:

večkodnost, pismenost, večrazsežna pismenost, metasemiotska ozaveščenost.

Sledenje večkodni pismenosti v šolah: študija primera

Članek predstavlja orodja, ki jih lahko uporabimo za merjenje študentske večkodne pismenosti in metasemiotske ozaveščenosti. Rezultati raziskave so zanimivi v kontekstu razvoja večrazsežne pismenosti tako z vidika sledenja posameznega študenta skozi čas ali primerjalno z drugimi študenti znotraj določenega predmeta ali s podatki iz večjih vzorcev, na primer razlike na ravni ali usmeritvi izobrazbe, starosti, regije, nacije itn., da bi odkrili vzorce ali prednosti in slabosti večkodne pismenosti s širšega vidika.

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Introduction

Understanding a student's or a group of students' metasemiotic awareness in relation to critical multimodal literacy is a key step in designing learning to aid development and the eventual mastery of both existing and new genres (Boistrup & Selander 2022:8). The methods described here are used to identify specific remedial strategies. In this way, teachers can design learning paths and strategies "to meet the challenges and affordances offered by technology in a digital age.... in which language combines with images and sound resources in complex ways" (O'Halloran et al 2015:1).

The theoretical underpinnings are: systemic function linguistics (Halliday 1978) also incorporating notions of multiliteracy pedagogy (New London Group 1996; O'Halloran et al 2015); critical literacy (Unsworth 2001); multimodality informed by the approaches of Kress and van Leeuwen's *Visual Grammar* (1996) as well as Baldry and Thibault's (2006) considerations on clusters and logogenesis. Attention was also given to pictorial metaphor, and more specifically multimodal metaphor as described by Forceville (2009, 2016). A multimodal metaphor draws on two or more semiotic modes to activate mapping between the target domain and source domain [Lakoff, Johnson 1980]. That is to say that a message cannot be understood through just one of the semiotic modes but that there is a reinterpretation of one mode that depends on what is communicated by the other.

Enquiry on the staged interpretation of functional objects in text (Komninios 2019, Komninios 2020) has informed the development of these tools and analysis system. The findings from this research activity were combined with assessment theory (Black & Wiliam 2018) also acquired through language testing experience (Komninios 2006, Komninios 2007, Komninios 2010, Vasta & Komninios 2010) in the creation of the tools and data analysis.

Materials and methods

The tools come in the form of a questionnaire, the analysis of the data from the questionnaire, and, when possible, semi-structured interviews. The tools have undergone a staged development and have been refined over time.

They have been used with a variety of text types and age groups to measure both metasemiotic awareness and also to monitor and compare literacy development within and between groups.

The questionnaire and analysis methods were constructed around an SFL framework (c.f. Lim 2018, Beatty et al 2019) to probe Field, Tenor, Mode, the multimodal relations within a text focusing on the different semiotic resources, the use of framing and metaphor devices, and critical thinking. The questionnaire uses simple language and can easily be altered for other text types.

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1. What is the *advert/webpage/video* about?
 2. What made you think this?
 3. What is the role of colours?
 4. Are we (viewers) involved? If so, how?
 5. Why have they used a “XXXXXX” reference?
 6. What is the relationship between *the image, sound and the words*?
 7. What is the role of “XXXXXX”, in the *POSITION/TIME SEGMENT*?
 8. What is the final aim of the *advert/webpage/video*?
 9. Is it ethical, unethical, neutral?
-

A corpus was created that includes webpages, videos and advertising texts. This was subdivided and tagged according to age specificity (if applicable) or text complexity. For example, edutainment communication was subdivided into health and well-being, ecology, citizen rights, and further subdivided into webpages and videos and then sorted for age-suitability as expressed by the text creators. The advertising text corpus incorporating advertising texts that employed pictorial or multimodal metaphor or implicit bias or prejudice. This was subdivided into promotional and public service advertising and then further subdivided according to the category and complexity of the pictorial or multimodal metaphor (Forceville 2016).

The monitoring tools were applied on three different cohorts: 180 school children (aged 8-13 years) from three independent English language schools in Italy; 75 school children aged 16-19 in three secondary schools in Italy; 195 undergraduates at an Italian university. The edutainment website and video corpus was used with the 8-13 age-range school children to probe metasemiotic awareness and calibrate the tools and the advertising texts corpus was used on the 16-19 year old school children and the undergraduates cohorts.

Initially the questionnaire was paper-based and semi-structured interviews were carried out. This was done to refine and regulate the tool and also to archive the communicative production of the learner. This proved a useful tool for younger learners with more complicated texts types. The questionnaire was then subsequently administered via Google Forms. This allowed for anonymous data collection, the incorporation of dynamic texts like webpages and videos as well as static texts like posters, the easy collection of additional cohort information and the automatic organisation of data into spreadsheets for elaboration.

We will now look at the methods of analysis of a selection of these questions. For illustrative purposes and due to space constraints, we will look at questions 1, 2, 3 and 6 in reference to one advertisement (Figure 1.1) and the results of 16 students taken at random from the undergraduate cohort. The full data analysis will come later.

1. What is the advert about?
2. What made you think this?
3. What is the role of colours?
4. Are we (viewers) involved? If so, how?
5. Why have they used a road safety reference in the advert?
6. What is the relationship between the image and the words?
7. What is the role of “Eyes on the fries”, in the bottom right?
8. What is the final aim of the advert?
9. Is it ethical, unethical, neutral?

Figure 1.1: Example questionnaire

OPRLA analysis



Table 1: OPRIA

N°	Q1. What is the advert about?	O	P	R	I	A	
1	This advert is about the fight against cancer and smoke by the American Cancer Society.	✗	✓	✓	✓	✓	4
2	The advert is about the American Cancer Society.	✗	✗	✗	✓	✗	1
3	The advert is about the bad effects of smoking.	✗	✓	✗	✗	✓	2
4	This advert is about cancer.	✗	✗	✓	✗	✗	1
5	The advert is about cancer caused by cigarettes.	✓	✗	✓	✗	✗	2
6	It is an advert against cigarettes by the American Cancer Society.	✓	✗	✗	✓	✗	2
7	This advert represents the possibility of cancer with the cigarettes.	✓	✗	✓	✗	✓	3
8	It is about the spread of cancer because of the cigarettes.	✓	✗	✓	✗	✓	3
9	This advert talks about a danger disease and maybe addiction.	✗	✗	✗	✗	✓	1
10	This picture represents the fight versus the cigarettes.	✓	✗	✗	✗	✓	2
11	It is about cancer caused by cigarettes.	✓	✗	✓	✗	✗	2
12	The ad is about cancer.	✗	✗	✓	✗	✗	1
13	Is about cancer.	✗	✗	✓	✗	✗	1
14	Is about cancer which is increasing more and more.	✗	✗	✓	✗	✓	2
15	This advert is about cancer.	✗	✗	✓	✗	✗	1
16	It is about cancer.	✗	✗	✓	✗	✗	1
17	It is about cancer disease.	✗	✗	✓	✗	✗	1
18	The advert is about cancer caused by smoke.	✗	✓	✓	✗	✗	2
19	It's about sensibilizing against practices that would probably lead to cancer, like smoking.	✗	✓	✓	✗	✓	3
20	It's about the cancer caused by smoking.	✗	✓	✓	✗	✓	3
		6	5	15	3	9	38
Percentage %		30	25	75	15	45	38%
		O	P	R	I	A	

Table 1 shows the results for Q1 which adopts a method of analysis that supports the need to assess students' responses collectively and individually. On the one hand, it provides column-based identification of focal items in the students' responses namely: objects (O), processes (P), results (R), institutions (I) and abstract properties (A). For example, in their replies the students could have focused on the significance of science and scientific institutions which often promote socially-committed advertising. Specifically, they could have cited the efforts to stamp out smoking being made in this advert by the ACS, an authoritative cancer-fighting US institution. In fact, as Column I shows, only a 15% students (3/20) mentioned the ACS's role, while the 75% (15/20) focused instead on the result of smoking (Column R). At the very same time, each row in Table 1 uses a lowest-to-highest 0-5 scale to measure each student's capacity to entertain multiple perspectives in their replies. The overall

score for the twenty students was 38 out of a possible 100, giving an average score of 1.9 out of a possible maximum score of 5. Specifically, there were 8 students with a score of 1 and 7 with a score of 2, while 4 students scored 3 and just 1 (Student 1) showed a more comprehensive 'grasp' with a score of 4. By analysing and comparing each answer it becomes possible to develop remediation strategies that address shortcomings, most prominently improving the capacity to identify and describe the cultural processes (describing causation, sensitising, warning, etc.) that specifically underlie advertising (public service advertising in this case) as reflected in the reply given by one student (Student 13). All advertising makes some kind of appeal typically designed to influence behaviour. In this advert a plea is being made by experienced medical doctors whose affective as well as textual nature merits deeper analysis. Clearly, to contribute properly to young people's overall education, their multisemiotic analysis and their awareness of textual composition must be developed alongside their ability to recognise and report on the multiple perspectives that a text presupposes.

Keyword and key visual analysis

Question 2 separates verbal focus (Column A in Table 2) from visual focus (Column B). The final column (Column C) is where the student makes a reference to the text as a whole. The verbal elements were: A1) Downloading Cancer; A2) CTRL ALT DEL; A3) American Cancer Society. The visual elements were: B1) the downloading bar; B2) the cigarette; B3) the logo. As before, this form of analysis qualifies and quantifies the students' responses but, in this case, the responses indicated to the research team whether word focus or visual focus contributed more to the students' description. In actual fact, they were evenly balanced. Indeed, the results obtained for Group A were 10 verbal foci, 12 visual foci and 4 whole text references while for Group B they were 9 verbal foci, 8 visual foci and 3 whole text references. What instead is striking is that, while there is only a slight deviation from a 1: 1 verbal/visual ratio, the overall score is 46/140 corresponding to a score of 33/100, which is even lower than the score for Q1 (38/100). In other words, on average, each student identified one visual item and one verbal item, suggesting a poor understanding of the interplay between the items that make up the text, a finding confirmed by the even smaller number of references to a photo, a picture, a warning, i.e., to the text as a whole and confirming the absence of a holistic description of the advert that we also found in the responses for Q1.

Table 2: Keyword and key visual analysis 2

N ^o	Q2. What made you think this?	A			B			C	
		1	2	3	1	2	3		
1	It made me think about the written bottom right	✓	✗	✗	✓	✓	✓	✗	4
2	It makes me think this because I see a cigarette and the words "downloading cancer".	✗	✓	✓	✗	✗	✗	✗	2
3	It makes me think this because I see a cigarette and the words "downloading cancer".	✓	✗	✗	✗	✓	✗	✗	2
4	Because in the middle there is the word "cancer" and in the bottom on the right there is an American Cancer Society	✓	✗	✓	✗	✗	✗	✗	2
5	I believe it is a warning about the consequences of smoking	✗	✗	✗	✗	✗	✗	✓	1
6	Because the photo represents a downloading bar that looks like a cigarette.	✗	✗	✗	✓	✓	✗	✓	3
7	Because is this picture there is a thin rectangle with the colours of the cigarette and a writing that wants to focus attention on dangers of smoking.	✓	✓	✗	✗	✓	✗	✓	4
8	I think so because there is a bar of download that is similar to a cigarette.	✗	✗	✗	✓	✓	✗	✗	2
9	Because of the icon of the American Cancer Society and the similitude between the cigarettes and the image.	✗	✗	✓	✓	✓	✓	✓	5
10	Because it's write in the Title "Downloading Cancer"	✓	✗		✗	✗	✗	✗	1
11	We can the possibility to decide about our health and we can stop smoking	✗	✗	✗	✗	✗	✗	✓	1
12	We can see in the image a downloading line to represent how cancer is increasing and it shows one of he main causes: smoking.	✓	✗	✗	✓	✓	✗	✗	3
13	From the quote "downloading cancer" and the association who create the ad American Cancer Society	✓	✗	✓	✗	✗	✗	✗	2
14	That we are going to get cancer	✗	✗	✗	✗	✗	✗	✓	1
15	This made me think that someone is about to have cancer	✗	✗	✗	✗	✗	✗	✓	1
16	For the words used	✓	✗	✓	✗	✗	✗	✗	2
17	Because there is a cigarette, and much more as the word CANCER, so you can link this two things	✓	✗	✗	✗	✓	✗	✗	2
18	The cigarette and the word cancer	✓	✗	✗	✗	✓	✗	✗	2
19	Because there is a downloading bar which looks like a cigarette and it's downloading the cancer	✓	✗	✗	✓	✓	✗	✗	3
20	The fact that the progress bar forms a cigarette and it is downloading cancer	✓	✗	✗	✓	✓	✗	✗	3
		12	2	4	7	11	2	7	46
		18			18			7	

The advert chosen for this experiment contained a multimodal metaphor (Forceville 2016) extending from the centre to the bottom right corner of the page, and thus a rather complex relationship between visual and verbal items. However, by breaking down the items on the page and identifying what the students prioritised, the researchers learnt what the students did, and did not, understand about meaning-making processes. These results were important when identifying where to focus attention in course designs

Colour interpretation

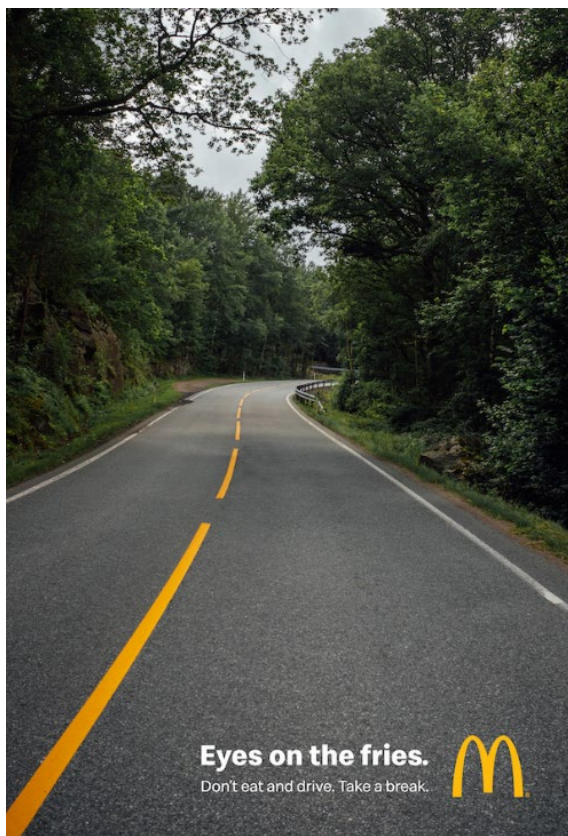


Table 3: Colour interpretation

N ^o	Q3. What is the role of colours?	Part	Whole	FG/ BG	Abstract	
1	They seem neutral to me	N/A	N/A		N/A	0
2	The yellow lines want to resemble the logo of McDonald and also the color of the fries	✓	✓			2
3	The colours are dark and I think that the graphic who designed this advert chose those colors to symbolize the fact that when you're hungry you can't always see clear	✓			✓	2
4	The role of the colors is to highlight the yellow that recalls McDonald's	✓				1
5	The colour yellow represents the main color of McDonald's	✓				1
6	The yellow color of the lines remember the fries of mc Donald	✓				1
7	Reminds me of the colours of the fries	✓				1
8	The colours have the role of <i>link between</i> the road and the fries, also the link for the adv and the McDonald brand	✓	✓			2
9	The yellow line painted on the tarmac is a reference to the colour of McDonald's logo and to fries	✓	✓			2
10	Yellow both as McDonald and warning colour	✓				1
11	The colors allowed me to associate the chips with the road and to link the slogan to a "be careful when driving"	✓	✓			2
12	The typical McDonald's yellow from the logo is the same of the stripes on the road, which are usually white. The colour creates a connection between the seemingly unrelated scenery and the brand	✓	✓	✓		3
13	Yellow	✓	N/A		N/A	1
14	Colors sell the product very well in this case because the yellow color is a vivid one and in this photo it really gets your attention first because of the contrast with the darker ones in the picture. Plus the <i>fries</i> and the logo share the same color so that french fries do not have to appear in the picture for you to desire them. Its about creating the image in your fantasies, they make you dream about it	✓	✓	✓	✓	4
15	The role of colors in <i>advertising</i> is to immediately refer to the colors of the McDonald's logo and their French fries	✓	✓			2
16	<i>Yellow like the fries, draws the attention here</i>	✓				1
		15	7	2	2	26

Colour is capable of building perspectives on texts that are very different from those expressed through language, or other meaning-making resources. Kress and van Leeuwen (2002) have pointed out that colour is extremely difficult to define in terms of its functions in texts. A good starting point is to base chromatic awareness on the notion that individual colours relate to each other and to other resources in a given text. A focus on the contrastive use of colours helps newcomers in critical multimodal text analysis to sharpen their sensitivity to how objects, and their parts, come to be distinguished. In this advert, the multimodal metaphor that the message hinges on relies on the use of the colour yellow. The yellow lines that form part of the road's semiotic structure; the yellow of the fries that are a part of the McDonald's experience, the yellow of the McDonald's logo. After reading the text (*Eyes on the fries*) in the bottom right, the viewer reinterprets the yellow road lines (modified from white to yellow) as fries. This reinterpretation highlights the dangers of eating and driving as a driver's eyes should be on the road (white road markings), and not the yellow fries (modified road markings) that are nothing but a distraction to the (dangerous) activity of driving. This is reiterated with the subordinate writing "Don't eat and drive. Take a break". It is also thanks to the foreground/background colour relationship that this message is conveyed. The background is without any disturbing or distracting features nor modification and is strictly loyal to the representation of the landscape. The foregrounded yellow lines, however, are salient, and when reinterpreted as 'fries', are seen as having been modified (from white to yellow) and as such demand an undue amount of the driver's attention, causing distraction and potentially an accident in an otherwise calm situation. Yellow also features as a colour rhyme with the yellow of the McDonald's logo, bringing an even greater coherence to the use of colour in the text, ultimately framing the message as 'McDonald's, a purveyor of civic responsibility as well as purveyors' fast food', and maybe by extension of association that McDonald's fast food is also civically responsible.

However, our focus when asking about colours was to test whether students could relate them to whole/part relationships in texts, often closely associated with the need to look at the difference between a text's foreground and background and also more generally to the more critical thinking aspect of the abstract use of colours in texts of this type in general.

What emerges from analysis is the students focus on the interplay between colours and other resources in structuring multimodal texts. Not unexpectedly nearly all the

students 15/16 mentioned the colour yellow. However, foreground/background contrasts were mentioned by only 2 students. Nearly half the students, 7 out of 16 students, managed to verbalise the whole-part relationship that is central to the text's message. However, only 2 students related this to a more critical thinking aspect, with consideration of colours in this text type in general. While all the students made only very general statements, only 1 student showed better descriptive skills by mentioning all aspect of the analysis.

Levels of Interpretation and Framing

The focus here is to consider the depth of students' level of analysis when exploring the relationship between semiotic resources in texts and the framing that is set up by these contextual elements. Here too, the quality of the students' interpretation is also measurable. Table 4 distinguishes between three depths of analysis. In this text, Level 1 (L1) identifies students making a link between the lines and the fries (14/16), while Level 2 (L2) is achieved if the multimodal metaphor is specifically referenced i.e., the reinterpretation of the image because of the words, identified by few students (4/16); Level 3 (L3) refers to the framing that is set up i.e., McDonald's as the purveyor of safe driving (civic responsibility) as well as fast food. L2 and L3 implies greater competence i.e. a deeper level of metasemiotic and cultural awareness insofar as it shows an understanding of, for example, the fact that this is a promotional advertisement and not a public service advertisement and as such, the primary behaviour change the company is seeking is to sell its goods and not the general welfare of citizens as road users.

The focus here was on the depth of the word-image relationship and the framing that is created due to this. The results show that few students reached the deeper level of analysis with 14/16 demonstrating an L1 level of analysis, 4/16 demonstrating L2 and 0/16 reaching L3 verbalisation of framing and critical thinking.

Table 4: Levels of Interpretation and Framing

N ^o	Q6. What is the relationship between the image and the words?	L1	L2	L3
1	They are strictly related	N/A	N/A	
2	The words, referring to the streets, are <i>relating</i> directly to the image of the road	✓		
3	The <i>line</i> on the road are yellow just like the fries	✓		
4	The relationship between the image and the words <i>only the importance given to roadside attention and McDonald's</i> , therefore to <i>stopping</i> to eat something to then keep the attention better	✓	✓	
5	The yellow lines on the road represent the fries of McDonald's	✓		
6	The words are in relationship with the image because McDonald's is representing the moment of <i>eat with the lines like fries</i> is	✓		
7	Follow the road			
8	The road lines are very similar to the fries of McDonald's	✓		
9	It should have been eyes on the road, but it is eyes on the fries instead. The road is still there as a picture, though.	✓	✓	
10	A strong relationship	✓		
11	It is a word pun <i>to say</i> that it is better to drive safe instead of eating while driving. So drive safe take a break, hopefully stay at McDonald's for your break so that you may find the will to eat something you <i>dont</i> really desire and ruin your stomach with their products!	✓		
12	We can see that the road is not straight, therefore driving requires concentration. If a person is both driving and eating at the same time, they cannot concentrate on either of those things	✓		
13	The relationship is that when you drive you don't have to eat but when you don't drive and you're stuck at McDonald's <i>yes</i>	✓		
14	For me this ad tries to warn you about not eating while driving so you don't risk making an accident by losing attention by eating. Has been done for sure because people tend to eat while driving and <i>risk making</i> accidents. In the ad we can immediately see a strong reference to the color of the brand and the product that are sponsored (French Fries) namely yellow. Personally, I think that even if the brand tries to make the viewer involved by inserting the image of a road full of dangerous curves. <i>I personally think that even if the brand tries to make the viewer active by inserting the image of a road full of dangerous curves, the announcement could be better because it does not show in any way how dangerous it is to eat while driving. And the references to the brand are thin and even those could definitely be made better</i>	✓	✓	
15	Words allow us to understand the image and the image gives meaning to words. They influence each other	✓	✓	
16	<i>The colour, logo and lines, driving and road</i>	✓		
		14	4	0
		87.5%	25%	0%

Conclusions

Through data analysis of these results at the beginning of a course, a teacher can plan specific remedial strategies for those students. For example, if there is a lower score in the understanding of the image-word relationships in a text compared to the other aspects, remedial strategies can focus on that aspect. This can be applied to the class but also to identify an individual within the group that might need more support on one aspect compared to the rest of the class. The teacher can also monitor progress by administering the questionnaire with different but similar texts in terms of genre and complexity at various time intervals during a course. In this way, a teacher can check their didactic approach and the development of their students.

Although still early in the research stages, some interesting results have emerged from the analysis. There appears to be an increasing focus on words according to an increase in age and with education level. The results showed that a distinction between focus on parts or whole text interpretation of colour changed according to both gender (boys focusing on whole text and females on parts, but neither making adequate link between the two unless guided) and education level and education orientation.

Monitoring tools that measure student progress in their critical analysis of unfamiliar texts and genres cannot be underestimated as a pedagogic tool. Only when such monitoring is carried out, can reliable claims be made about the results that such courses achieve. These tools make it possible to introduce adjustments and correctives in an ongoing course as they identify specific barriers to understanding regarding overall student cohorts or specific individuals. Monitoring tools of this type presuppose an ability to build a critical framework of analysis for individual texts but also to introduce improvements in the way feedback data can be obtained and accessed. These tools are a scale-based graded assessment system capable of building up a picture of the capacity to verbalise multisemiotic competence from a variety of perspectives. Excel-based results can be analysed quickly and findings made available to others for further development in keeping with the requirements of accessibility of scientific data and reproducibility of methods and experiments. To date these tools have been administered on small cohorts, using a limited number of texts-types but with a wide age-range.

In these small studies, they have proved remarkably efficient in contributing to course design, monitoring progress and the effectiveness of the pedagogic approaches adopted. There is also the potential to use the data as a powerful research tool for data collection on multisemiotic awareness and multimodal literacy in larger cohorts. With this in mind, future research with these tools is being directed at expanding corpus to other text types to include political discourse (party political broadcasts and campaign posters and so on), journalistic texts (news agency homepages, newspaper front pages, magazine covers, editorials and so on); information reports; and infographics.

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