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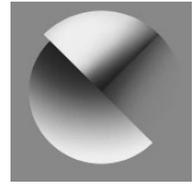
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Facial expressions in comics: an empirical consideration of McCloud's proposal

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ABSTRACT

In *Making Comics: Storytelling Secrets of Comics, Manga and Graphic Novels* (2006), Scott McCloud proposes that the use of specific drawing techniques will enable viewers to reliably deduce different degrees of intensity of the six basic emotions from facial expressions in comics. Furthermore, he suggests that an accomplished comics artist can combine the components of facial expressions conveying the basic emotions to produce complex expressions, many of which are supposedly distinct and recognizable enough to be named. This article presents an empirical investigation and assessment of the validity of these claims, based on the results obtained from three questionnaires. Each of the questionnaires deals with one of the aspects of McCloud's proposal: face expression intensity, labelling and compositionality. The data show that the tasks at hand were much more difficult than would have been expected on the basis of McCloud's proposal, with the intensity matching task being the most successful of the three.

KEYWORDS

basic emotions • comics • complex emotions • drawing faces • face compositionality • facial expressions • intensity of emotions • Scott McCloud

1. INTRODUCTION

Research into comics and cartoons is not just of interest for comics scholarship, but can also contribute to a greater understanding of how visuals are understood more generally. Like its verbal sister, successful visual communication depends on the ability of a viewer/reader to assess what explicit information a picture contains, and combine this with contextual information so as to derive crucial implicit information. In relevance theory, explicit information is said to be arrived at via decoding, leading to 'explicatures,' while implicit information is inferred, leading to 'implicatures' (e.g. Forceville, 2005b, 2014; Sperber and Wilson, 1995; Wilson and Sperber, 2012; Yus, 2008, 2011). By definition, information that is decoded is – at least to those in possession of the code – 'objectively' there, whereas information that is inferred is to a lesser (strong implicatures) or greater (weak implicatures) extent dependent on a specific individual's interpretation. For visual studies, it is thus theoretically important to assess which, if any, explicit information is present in a given picture, as this part is not open to variation in interpretation.

One of the theoretically attractive dimensions of the medium of comics is that it features several coded elements (see Forceville et al., 2014). One of these is the reading/viewing path across a mainstream comics page (or a two-page 'spread') that a typical reader will engage in. In the case of a standard grid pattern in a Western comic, this is usually in a Z-pattern (i.e. from left to right and from top to bottom), but there are exceptions in which panels appear in a non-typical manner on the page: they may not be square or rectangular; they can be embedded; and/or they may have different sizes (see Cohn, 2011, 2013; Groensteen, 2013). Another is the text balloon, which not only codes which character is saying or thinking something, but may also specify the *manner* in which this saying or thinking is done (e.g. Cohn, 2013; Forceville et al., 2010; Groensteen, 2007). A third element is motion and emotion lines (sometimes called 'pictorial runes'): such lines appear to constitute a limited set and to be used with a specific meaning (Bateman and Wildfeuer, 2014; Forceville, 2005a, 2011; Tasić and Stamenković, 2017). None of these elements, however, pertains to the depiction of comics characters' faces and bodies (but cf. Abbott and Forceville, 2011).

In one of the most intriguing chapters in *Making Comics: Storytelling Secrets of Comics, Manga and Graphic Novels*, Scott McCloud (2006) suggests that a competent comics artist should be able to draw a face whose expression expresses a specific emotion. Taking his cue from Darwin (1998[1872]) and Ekman (e.g. Ekman, 2003; Ekman and Friesen, 1971, 2003), who both stress that facial expressions conveying emotions are innate and evolutionarily significant for survival, he argues that expressing a specific emotion in comics is done by drawing the right combination of lines, each of which depicts a certain muscle being activated. This emotion can moreover be depicted with different degrees of intensity. Since emotions provide key clues to understanding cognition, motivation and people's behaviour in general (Matsumoto, 2001:

171), reading emotions from faces clearly is an essential skill in social interaction. In a daring passage, McCloud goes on to claim that the way in which the six 'basic emotions' – ANGER, DISGUST, FEAR, JOY, SADNESS and SURPRISE – are depicted allows for various permutations, resulting in more complex emotions. For instance, he argues that combining the typical ANGER face with the typical DISGUST face results in an OUTRAGE face, while FEAR + SADNESS = DEVASTATION (p. 85). If McCloud is right, this would mean that both the six basic emotions and a much larger number of 'complex' emotions can be depicted in such a way that a reader/viewer can *decode* these emotions as well as their intensity.

McCloud's, however, is by no means a foregone conclusion. While it is true that the universality of basic facial expressions is no longer questioned in modern psychology, and is considered a pancultural aspect of psychological functioning, expressions can be affected by culturally prescribed display rules (Matsumoto, 2001: 173) overruling universality in specific social circumstances (Ekman, 1972; Friesen, 1972). Moreover, there are individual differences between people in how well or accurately they can read emotions from facial expressions – an ability that may be influenced by age, medical condition, developmental disorders, or genetic make-up (see Adolphs, 2002; Dawson et al., 2004; Golan et al., 2007; Shaw et al., 2005). In short, the issue of emotions in human faces, both in terms of production and comprehension, is obviously a matter of interest in several disciplines.

In this article, we attempt to shed more light on the issue of the facial representation of emotion from the perspective of comics studies by reporting and discussing the results of an experiment testing several hypotheses derived from McCloud's claims. The structure of this article is as follows. In section 2, we provide a brief review of literature related to facial expression in comics, in section 3 we describe the background of our experiment, which is followed by the description, evaluation and discussion of the experimental results in section 4. Section 5 offers a summary of the conclusions and suggestions for further research.

2. FACIAL EXPRESSIONS IN COMICS: A BRIEF LITERATURE OVERVIEW

The exploration of drawing facial expressions in comics dates back to the pioneering work of Rodolphe Töppfer, who tackled the issue of subtle changes in facial features and the resulting implications in his *Essay on Physiognomy* from 1845 (Töppfer, 2003[1845], edited by Thierry Groensteen). Töppfer believed that slight alterations in the rendering of characters' facial features could lead readers/viewers to different conclusions regarding the characters' personalities.

But it was Will Eisner who provided the first major exploration of how facial expressions can be represented in comics, and attempted to study the face 'without regard to individual personality' (Eisner, 2008[1985]: 112). This seminal study was later expanded, edited and posthumously published

in *Expressive Anatomy for Comics and Narrative* (2008). Here Eisner claims that the structure of the eyes, ears, nose and mouth of a character provides the individual characteristics that allow an artist to easily display and communicate emotions and personal identities. By closely studying the human anatomy, Eisner illustrates how the muscles on the face work in unison to express different emotional states. Recognizing that the face is the body part that draws most immediate attention, and that artists have been using faces to study character for centuries, Eisner also approvingly summarizes Töpffer's important insights.

Nevertheless, when speaking of human emotion, Eisner (2008: 57) cautions that 'the draftsman should keep in mind that an emotional display is not necessarily confined to the face.' He emphasizes the importance of being able to convey different emotions through skilful articulation of universal postures and gestures, and that an artist should take into consideration all sorts of different aspects of a specific character, such as their age, sex, anatomy, personality and even their profession, which all contribute to an appropriate expression of a desired emotion. Eisner illustrates his views by providing examples for various emotions, namely, hate, shame, love, surprise, anger, fear, joy and grief. All the examples include minute instructions on the use of different combinations of facial expressions and other anatomical peculiarities of the human body.

Facial expressions in comics have also been examined with reference to Peirce. Differentiating between 'icon signs', 'index signs' and 'symbol signs' in comics, Duncan and Smith (2009: 11) consider most facial expressions to be index signs of characters' emotions. Cohn (2013: 28–30) shows how semiotics researchers have continued Töpffer's pioneering work, especially through more complex investigations into how 'graphemes' – basic graphic forms such as lines, dots, and shapes – combine to influence meaning. Kukkonen (2013: 15) claims that 'the faces of comics characters are spaces which give you textual clues as dense as any speech bubble.' According to Kukkonen, facial features are often stereotyped in comics and, as such, they give readers/viewers information on what kind of character is being presented. They also provide an idea of what a character feels, communicating the emotions and the mental states intended to be represented by the artist.

3. MCCLOUD'S *MAKING COMICS* (2006) AND SPINDLER AND FADRUS'S APPLICATIONS

Our study was motivated by the beginning of the second chapter of McCloud's *Making Comics* (2006), 'Facial Expressions', which presents the principles of expressing emotional content through drawing facial expression in comics. Drawing facial expressions, according to McCloud, is a very important aspect in the creative process of making comics since comics, similar to any other storytelling medium, are likely to be evaluated with

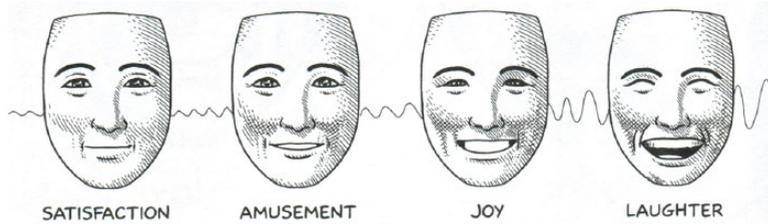


Figure 1. Varying intensities of a facially expressed emotion (McCloud, 2006: 84).

regard to their ability to evoke emotions in the reader. We may also add that in social relationships between people or characters, a correct assessment of others' emotional states is crucial for pleasant and effective interactions. But the complexity of the issue is evident straightaway: McCloud asks the reader to interpret a face with no specific or intended expression, rightly believing that different viewers would describe it differently: as calm, thoughtful, reverent, or reflective, for instance. This example speaks volumes about the difficulties one might encounter when faced with a labelling or emotion identification task. In order to tackle the issue of expressing emotions via facial expressions in comics, McCloud proposes that the following aspects should be analysed: (1) the different kinds of facial expressions found in comics; (2) how these expressions are formed by the muscles of the face; (3) the various ways of rendering them graphically; and (4) how facial expressions operate in comics sequences. He starts with the idea that the source of complex emotions is found in the building blocks inherent in faces that express basic emotions. Drawing on the work of Charles Darwin (1998[1872]) and Paul Ekman (e.g. Ekman, 2003; Ekman and Friesen, 1971, 2003), McCloud (2006) defines six basic emotions ('primaries') in facial expressions that are thought to be universal regardless of culture, language or age, and from which others are derived: ANGER, DISGUST, FEAR, JOY, SADNESS and SURPRISE. McCloud then presents the way to vary the intensity of the primaries and names four levels within each primary (as shown in Figure 1).

After this, he suggests that, by mixing any two of the emotional primaries, an artist can produce a third, more complex facially expressed emotion, as shown in Figure 2. McCloud compares these 'primaries' to the basic colours, which can also be modified and mixed to create many others. In many cases, McCloud claims, an emotion is 'distinct and recognizable enough to earn its own name' (p. 85). For instance, combining ANGER and DISGUST will result in OUTRAGE, while FEAR and SADNESS will produce DEVASTATION. According to McCloud, in these cases it seems plausible that viewers will more or less agree on the resulting emotion depicted. But McCloud's idea of compositionality goes one step further when he proposes that mixtures of other intensities and mixtures of three or more primaries can also occur and yield new emotions, which could produce over a

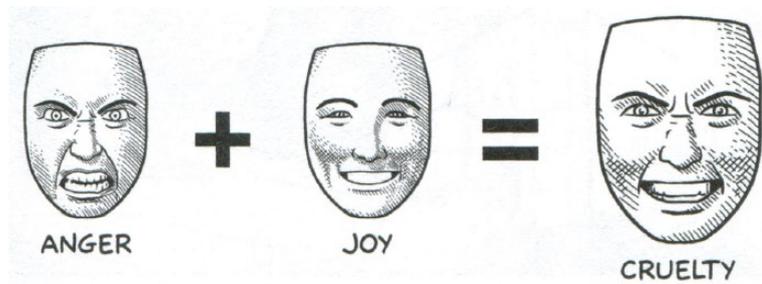


Figure 2. Example of the composition of a complex facial expression (McCloud, 2006: 85).

thousand possible combinations (p. 86). To be more precise, by combining two or three of four intensities of the six primaries, we should be able to generate 2300 different drawn faces.

McCloud's approach influenced the development of the Grimace Project (2017[2009]), created by Oliver Spindler and Thomas Fadrus, partly based on Oliver Spindler's (2009) MA thesis. Following McCloud's (2006: 83–85) depictions, Spindler and Fadrus developed a facial expression display using web technology with the goal of finding a non-verbal representation of emotions that could be integrated into interactive systems. Their software component can display all primary and secondary emotions as depicted by McCloud, but the primaries can be blended in arbitrary intensities (e.g. ANGER in the intensity of 75% can be mixed with FEAR in the intensity of 50%), thus covering states not covered before and having an enormous number of combinations – based on McCloud's ideas of intensification and face compositionality. The project was developed in Actionscript 3 and deployed as a Flash file that renders human facial expressions based on a mixture of the six primaries. The project also features an online study similar to the second questionnaire we use in our work. As far as we know, the results of the Grimace Project study have not been published, which is why we offer no comparison of our procedures and Spindler and Fadrus' results. We have, however, decided to adopt a procedure very similar to the one that was used by Spindler and Fadrus in their online study. In the next section we report the results of a three-part experiment in which we tested participants' responses to McCloud's faces.

4. THE STUDY AND DISCUSSION

Participants

Ninety-five undergraduate students at the University of Niš (35 students of English and 60 students of Mechanical Engineering; 55 male and 40 female, with an average age just under 21) participated in the study on a voluntary basis. We asked the participants whether they were comics readers or not.

Materials and design

We designed three questionnaires based on McCloud's (2006: 80–101) chapter on facial expressions from *Making Comics*. To avoid the possibility of priming effects, we randomized the order in which different groups of participants performed the tasks. As the original names of the facial expressions were given in English in McCloud's book while the native language of all of our participants was Serbian, we translated each term from English into Serbian (we note that the translation could not always be literal). The graphic material for the questionnaires (McCloud's drawn faces) was taken directly from the book.

Procedure

The three questionnaires were administered one after the other in a pen-and-paper procedure in a session that had no imposed time limit but lasted approximately 45 minutes. We had six groups of students for the six possible combinations of these three tasks, each group being assigned a different order (1–2–3, 1–3–2, 2–1–3, 2–3–1, 3–1–2, 3–2–1); moreover, participants were not allowed to go back to the tasks they had already completed. Five participants failed to complete the first questionnaire, two failed to complete the second, and one failed to complete the third. However, their responses related to the tasks they *did* complete were taken into consideration. The responses were then coded and entered into a statistics software package, which allowed us to calculate the results.

Comics readers group vs the rest

As 23 of the respondents claimed to be comics readers, we decided to compare the scores of the comics readers group with those of the non-comics readers group in order to see whether this resulted in significant differences. This was done by performing a one-way between-subjects ANOVA test, directed at the respondents' cumulative correct scores on the most difficult of the three tasks we are going to report. As the differences between the groups did not reach statistical significance in our case ($F(1, 72) = .193, p = .662$), we decided to include all the responses in the statistics.

Q1: The intensity matching task

In the first task, we tested McCloud's notion of emotional intensity. The total of 24 facial expressions showing four levels of intensity of the six primary emotions – ANGER, DISGUST, FEAR, JOY, SADNESS, SURPRISE – were taken from McCloud (2006: 84) without any labels, the idea being that labels might influence the scores in a way that a weak–strong scale would not. Their order was randomized and each of the faces was assigned a number. The respondents were to complete the chart shown as Table 1 by inserting the numbers corresponding to the 24 faces in one of the cells. Each cell, that is, was to be filled with *one* number.

McCloud used the following labels for the facial expressions we used in this task (the primary emotion is given in bold):

STERNNESS–INDIGNATION–**ANGER**–RAGE

DISDAIN–AVERSION–**DISGUST**–REVULSION

CONCERN–ANXIETY–**FEAR**–TERROR

SATISFACTION–AMUSEMENT–**JOY**–LAUGHTER

DEJECTION–MELANCHOLY–**SADNESS**–GRIEF

ALERTNESS–WONDER–**SURPRISE**–SHOCK

Table 1. The emotion intensity chart.

Emotion (category)	EMOTION INTENSITY (fill in a number into each cell)			
	Weakest	Weak	Strong	strongest
anger				
disgust				
fear				
joy				
sadness				
surprise				

The aim of this task was to test whether the participants could detect the key differences in drawn facial expressions that make the basic emotions more or less intense, and moreover correctly identify the emotion represented.

In Table 2 we show the most frequent responses per intensity level of each of the primary expressions McCloud graded for intensity. Each of these levels includes the top two answers – for instance, in the first row, we find that when it comes to the weakest form of **ANGER**, 61 respondents decided to insert the face McCloud labelled as ‘sternness’ (the correct response in this case), while 14 of them decided to use the face labelled ‘dejection’ for this field (which, according to McCloud’s classification, belongs to the category of **SADNESS**). In the case of the strongest form of **SURPRISE**, 65 respondents decided to fill in the face called ‘shock’ (which thus also conforms to McCloud’s intention), while 10 respondents used the generic face called ‘surprise’ (which in this case was not strong enough to be correct). The numbers given in bold italics represent the faces that matched McCloud’s intentions when it comes to the intensity within a particular category.

In the intensity matching questionnaire, our participants were by and large ‘correct’, i.e. their responses largely corresponded to what McCloud proposed as the right order of intensity grading. As we can see, the responses mostly agree with McCloud’s proposal for the categories of **JOY** and **ANGER**, followed by **SURPRISE** and **DISGUST**, and finally by **FEAR** and **SADNESS**. The last two were the least correct, particularly with regard to the weakest form: in the

case of FEAR, the respondents were in two minds choosing between CONCERN and DEJECTION. They frequently (and wrongly) used the same face, CONCERN, as the weakest form of SADNESS. The intended face from this category, DEJECTION, was more frequently used in the categories of FEAR and ANGER.

Q2: The label matching task

In the second task, the respondents were asked to match 21 facial expressions, 6 primaries and 15 complex ones (i.e. all possible combinations of the six primaries given in their 'default' intensity), with labels corresponding to each of them in McCloud (2006: 83–85). The labels were: ANGER, DISGUST, FEAR, JOY, SADNESS, SURPRISE (primaries), AMAZEMENT, BETRAYAL, CAGED ANIMAL, CRUELTY, DESPERATION, DEVASTATION, DISAPPOINTMENT, FAINT HOPE, HORROR, OUTRAGE, PAIN EMPATHY, SPOOKED, EEW!!!, WHAT THE -?! and YOU ATE IT?? (complex expressions). The order of the expressions was again randomized. The respondents were to choose a label for each of the 21 facial expressions – whereby each label could be used only once. The goal of this task was to check how easy or difficult it would be to attach a verbal label to a facial expression.

The results of the label matching questionnaire are presented in Table 3. On the vertical axis we have plotted all the facial expressions that needed to be labelled. The respondents were asked to attach (only) one of the labels shown on the horizontal axis to each of them. The numbers show the number of participants who used a particular label for the given face. For instance, in the first row we find that 55 participants decided to use the label 'amazement' for the face that, in McCloud's model, showed AMAZEMENT, whereas 20 of them decided that it should be called 'surprise'. The expressions given in bold are the primaries, while all the other ones are complex emotions. The cell shading is in line with the number of responses, formatted using Microsoft Excel's 'Conditional Formatting Color Scales' function, where dark shading stands for high scores, intermediate shading for medium scores, and light or no shading for low scores.

Labelling facial expressions appears to have been quite a difficult task. Actually, at the beginning of his intriguing chapter, McCloud himself notes that the process of naming emotions can be ambiguous, as readers are likely to recognize various emotions even in a very simple face. Our results show that, in fact, only four emotions were correctly identified by a majority of the participants, given here in the order of the number of correct responses: JOY (79/95), CRUELTY (59/95), AMAZEMENT (55/95) and SADNESS (49/95) – among which, perhaps unexpectedly, only two are primary emotions. The rest of the primaries had varied ratings: SURPRISE was correctly labelled 'surprise' 36 times, with the second most selected option being 'spooked' (19 responses), which, given the overall scores can be considered fairly consistent. ANGER was labelled

Table 3. The response frequencies in the label matching task (the drawings were taken from McCloud, 2006: 83, 85).

Face↓ Label↓	Amazement	Anger	Betrayal	Caged Animal	Cruelty	Desperation	Devastation	Disappointment	Disgust	Eeww!!	Faint hope	Fear	Horror	Joy	Outrage	Pain empathy	Sadness	Spooked	Surprise	What the -?!	You ate it?!
 Amazement	55	0	0	0	0	0	0	0	0	0	2	0	0	5	0	0	0	5	20	2	0
 Anger	0	31	5	38	3	1	0	2	1	1	1	0	2	0	0	1	0	1	0	0	0
 Betrayal	0	3	6	2	2	7	4	5	11	9	0	2	10	0	16	1	1	3	0	1	6
 Caged animal	1	14	9	9	7	6	1	4	4	4	3	2	11	0	3	0	0	1	0	0	9
 Cruelty	0	0	7	2	59	1	1	2	1	2	3	0	1	1	0	0	0	1	1	1	2
 Desperation	8	0	1	3	0	6	3	1	1	2	33	5	0	1	0	6	1	7	5	0	2

(Continued)

Table 3. (Continued)

Face↓ Label↓	Amazement	Anger	Betrayal	Caged Animal	Cruelty	Desperation	Devastation	Disappointment	Disgust	Eeww!!	Faint hope	Fear	Horror	Joy	Outrage	Pain empathy	Sadness	Spooked	Surprise	What the -?!	You ate it??
 Devastation	0	0	3	1	0	3	7	13	0	0	5	29	4	0	1	7	6	2	1	5	3
 Disappointment	0	0	9	1	1	4	4	17	0	0	2	11	4	0	1	14	2	4	2	13	1
 Disgust	0	0	1	2	0	3	8	2	22	28	2	0	1	0	11	7	2	0	0	0	1
 Eeww!!	2	0	5	0	1	14	7	6	5	11	3	1	2	3	4	7	7	3	3	0	2
 Faint Hope	3	0	1	4	2	9	13	0	2	2	17	1	2	1	1	15	6	2	0	2	1
 Fear	0	0	4	1	0	5	4	4	2	0	3	22	5	0	2	3	0	11	3	14	7

Table 3. (Continued)

Face↓	Label↓	Amazement	Anger	Betrayal	Caged Animal	Cruelty	Desperation	Devastation	Disappointment	Disgust	Eeww!!	Faint hope	Fear	Horror	Joy	Outrage	Pain empathy	Sadness	Spooked	Surprise	What the -?!	You ate it?!
	Horror	0	7	6	2	2	0	5	6	11	11	0	1	9	0	22	0	1	0	0	2	4
	Joy	5	0	1	0	0	3	0	0	0	0	0	0	1	79	0	0	0	0	0	0	0
	Outrage	0	24	3	12	3	3	4	5	4	5	2	0	9	0	4	0	0	2	0	3	4
	Pain empathy	0	0	3	1	1	9	6	5	17	7	1	2	6	0	6	14	8	1	0	0	3
	Sadness	0	0	0	0	0	6	22	1	0	0	1	0	1	0	0	6	49	0	0	0	0
	Spooked	2	0	1	4	0	1	1	2	1	1	2	5	2	0	1	3	0	11	15	25	12

(Continued)

Table 3. (Continued)

Face↓ Label↓	Amazement	Anger	Betrayal	Caged Animal	Cruelty	Desperation	Devastation	Disappointment	Disgust	Eeww!!	Faint hope	Fear	Horror	Joy	Outrage	Pain empathy	Sadness	Spooked	Surprise	What the -?!	You ate it??
 Surprise	12	0	2	0	0	2	0	0	0	0	1	3	0	0	1	1	0	19	36	3	10
 What the -?!	1	10	14	7	8	1	3	5	0	4	3	0	8	0	2	2	0	5	2	3	9
 You ate it??	1	0	10	0	2	0	1	3	5	5	2	2	9	0	16	0	1	4	1	14	13

‘caged animal’ by 38 respondents and ‘anger’ by 31. As we can see, many respondents chose a more intense label of ‘caged animal’ (in fact, a mixture of ANGER and FEAR). We could notice a very similar trend in the case of DISGUST, which was mixed up with the face McCloud labelled ‘eeww!!’ (28 responses), a peculiar combination of DISGUST and JOY, with 22 respondents labelling it ‘disgust’. Finally, FEAR itself had a more disparate set of responses, with only 22 subjects correctly labelling it as ‘fear’. In contrast, among many complex facial expressions, DEVASTATION was falsely identified as one of its two components, namely, 29 respondents labelling it as ‘fear’. When it came to the remaining complex emotions, the responses had a varying degree of diversity and different distributions. The factors that determined these included the complexity or the ambiguity of the facial expressions or different shades of meaning of the provided label. Besides this, as each label could be used only once, the responses were partly forced – the respondents had previously used some labels, so the label repository for the faces they were unsure of tended to be limited. The difficulty of the label matching task could also be related to McCloud’s idiosyncratic linguistic choices (for our purpose translated to Serbian): perhaps a different set of labels would have yielded different results.

Q3: The compositionality rating task

The third task contained the same set of faces as stimulus material as the second task, but instead of labelling them, the participants were asked to identify which of the six primary emotions was represented in each face (simple or complex) and to what degree this emotion was present, in the fashion shown in Table 4.

The procedure shown in Table 4 was repeated for all 21 facial expressions, with their order being randomized once again. If this task was not given as the first one, the respondents could not go back to the previous task(s) and see which label they had used for each of the faces. This procedure ought to test whether the constituent primaries could be identified in (i.e. decoded from) complex faces they build and, if one or more primary emotions were identified, to what degree the respondents saw these primaries as present. So, for instance, a respondent could say that she or he saw 0/7 ANGER, 3/7 DISGUST, 4/7 FEAR, 0/7 JOY, 7/7 SADNESS and 1/7 SURPRISE in a face. This questionnaire resembles the study available in the Grimace Project (2017[2009]), but differs from it in at least three important aspects: (1) the participants were allowed to choose up to two components in Grimace, whereas they had no such restrictions in our questionnaire, since we wanted to see whether the faces, originally composed by McCloud as combinations of only two primary emotions, seemed more complex to an unprimed eye, i.e. appeared composed, perhaps, of more than two primaries; (2) we decided to include a scale instead of a simple yes/no question; and (3) we included only the set of faces proposed by McCloud.

Table 5 presents the results of the compositionality rating task. The vertical axis shows all the rated facial expressions (6 primaries and 15 complex ones), while the horizontal axis presents the six primaries considered to build up the complex expressions. The minimal possible value was 0 and the maximal was 7, based on the 8-point scale described above. Similar to the previous table, we used the cell shading in line with the number of responses, in order to make the table more easily readable. The numbers given in bold

Table 4. An example from the Compositionality Rating Task (the drawing was taken from McCloud, 2006: 85).

Emotion	Can you recognize the following emotion in the face and to what extent?							
	0—not at all 7—completely							
anger	0	1	2	3	4	5	6	7
disgust	0	1	2	3	4	5	6	7
fear	0	1	2	3	4	5	6	7
joy	0	1	2	3	4	5	6	7
sadness	0	1	2	3	4	5	6	7
surprise	0	1	2	3	4	5	6	7



italics represent the two components intended to be found in McCloud's rendering of each face given in *Making Comics* (McCloud, 2006: 85). These are the two components McCloud used to make the complex faces. With the six primaries, only one component is given in bold italics. One should note that the labels accompanying the faces in Table 5 were not available to our respondents in any part of the procedure. They are included in the table only for the sake of clarity.

On the basis of the results for this task, we can conclude that non-complex, primary facial expressions rendered quite consistent results – ANGER, DISGUST, JOY, SADNESS and SURPRISE were correctly identified as having one dominant component (the component is the emotion itself in all five cases). The face depicting FEAR, by contrast, was not recognized consistently at all. Although the FEAR component was indeed recognized as being present in the given facial expression (3.89), the SURPRISE component in fact triggered a higher score (4.32) in this face. Based on the mean numbers, some of the complex faces were indeed marked as being composed of the intended primaries, though in varying proportions. For instance, AMAZEMENT was, as McCloud suggests, composed of JOY and SURPRISE (in the proportion of 3.78:5.19). DEVASTATION was seen as composed of FEAR and SADNESS, in the 4.12:3.38 proportion. The facial expressions that exhibited similar patterns when it came to our participants' responses were CRUELTY, PAIN EMPATHY, FAINT HOPE and SPOOKED. In some of the faces, along with the two expected primaries, a third primary emotion was recognized as playing a certain role. For instance, in CAGED ANIMAL, ANGER and FEAR were joined by DISGUST, in DESPERATION the expected emotions of FEAR and JOY were joined by SURPRISE, while ANGER accompanied DISGUST and SURPRISE in the YOU ATE IT?? facial expression.

Some other emotions, however, went far beyond or around McCloud's intentions. For example, McCloud used the primaries of ANGER and SADNESS to draw the face he dubbed BETRAYAL. Our participants, however, saw this face as largely composed of DISGUST and FEAR, while ANGER and SADNESS had considerably lower scores. Similarly, FEAR, which was used as a component in drawing HORROR, was seen as almost completely absent from the face.

Our findings show that, whereas participants were good at recognizing emotions in comics faces in the 'right' degree of intensity, the task of identifying exact emotions in a facial expression proved quite difficult as many complex and even one primary facial expression were not judged in line with the way they were intended to be interpreted by McCloud. Moreover, it seems that many complex faces in comics are far more than the sum of their parts. Even though McCloud literally combined elements of two primaries to build a set of complex faces, our participants sometimes saw other components not intended to be there – in certain cases, these elements even overruled the effects of the intended primaries. Therefore, although the resulting face may

Table 5. The mean scores per component in the compositionality rating task (the drawings were taken from McCloud, 2006: 83, 85).

Face↓	Contained basic emotion↓	Anger	Disgust	Fear	Joy	Sadness	Surprise
	Amazement	0.02	0.00	0.28	3.78	0.02	5.19
	Anger	6.38	1.77	0.31	0.00	0.27	0.35
	Betrayal	1.16	3.88	3.55	0.00	1.61	1.55
	Caged animal	3.38	2.77	1.98	0.00	0.91	0.95
	Cruelty	2.28	0.69	0.17	2.95	0.14	0.37
	Desperation	0.03	0.28	2.40	1.90	0.75	3.02
	Devastation	0.08	0.91	4.12	0.02	3.38	2.91
	Disappointment	0.11	0.58	3.43	0.01	2.42	3.31

Table 5. (Continued)

Face↓	Contained basic emotion↓	Anger	Disgust	Fear	Joy	Sadness	Surprise
	Disgust	1.44	5.30	0.98	0.00	1.51	0.25
	Eeww!!	0.31	1.52	0.57	2.74	1.75	0.42
	Faint hope	0.09	0.67	1.53	1.80	2.53	0.62
	Fear	0.44	0.90	3.89	0.00	0.53	4.32
	Horror	5.48	3.87	0.40	0.00	0.69	0.65
	Joy	0.08	0.15	0.10	5.41	0.08	0.35
	Outrage	6.20	1.83	0.23	0.00	0.43	0.42
	Pain empathy	0.66	2.92	2.39	0.00	3.05	0.22

(Continued)

Table 5. (Continued)

Face↓	Contained basic emotion↓	Anger	Disgust	Fear	Joy	Sadness	Surprise
	Sadness	0.27	0.44	1.84	0.00	5.81	0.25
	Spooked	0.02	0.35	2.67	0.00	0.55	5.23
	Surprise	0.00	0.14	1.39	0.04	0.18	5.76
	What the -?!	5.08	1.47	0.25	0.00	0.19	1.04
	You ate it??	3.01	3.22	1.80	0.00	0.97	2.95

seem to be nameable (with the naming itself proving to be difficult), it definitely has a considerable degree of unpredictability.

We can consider one or more reasons that could play a role in accounting for the results:

- (1) *McCloud's drawings do not succeed in cueing the essence of the emotions cued.* While we do not think that McCloud's craftsmanship is lacking, it is probably very difficult even for accomplished artists to cue particular emotions unambiguously.
- (2) *The various emotions (even the primaries) are less easily distinguishable from each other than suggested, and/or may overlap.* For instance, our participants would rather call BETRAYAL 'outrage', 'disgust', 'horror', 'ewww!!', or 'desperation' than 'betrayal' itself.
- (3) *The labels chosen by McCloud are sometimes too idiosyncratic to constitute adequate descriptions of the complex emotions.* It is to be noted, though,

that this is a problem that may be difficult or even impossible to solve: the many nuances of emotions that an accomplished artist is capable of drawing presumably simply do not have standardized equivalents in language. Smith (2017: 210) makes a very similar observation for film: 'language – no matter how we think of it – cannot substitute for the richness, density and nuance of perceptual and emotional experience.'

- (4) *McCloud's decontextualized faces exemplify a highly artificial situation, rarely encountered in isolated form in real life (i.e. in real comics).* While faces are important sources for the identification of emotion, especially intense emotions often are co-cued by physical states, body postures, gestures, and written text (see Cross, 2017; Eisner, 2008; McCloud, 2006).

5. CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

In this article, we set out to investigate several ideas emanating from McCloud's *Making Comics* – that by varying the intensity of the primaries and their features, an artist would be able to create degrees of the basic emotions; that some facial emotions are distinguishable enough to be nameable; and that the basic emotions can be combined to produce a number of complex expressions that would be universally understood by the audience. We assessed the validity of these claims using verbo-visual or visual questionnaires in three stages: (1) the intensity matching task, (2) the label matching task, and (3) the compositionality rating task. The intensity matching task was the only one that yielded results largely corresponding to McCloud's proposals. The label matching task proved to be very difficult as only six facial expressions received consistent or relatively consistent interpretations (i.e. were labelled in a way consonant with McCloud's proposals). Finally, the compositionality rating task results indicated that only a few faces yielded interpretations that were in line with McCloud's expectations. In complex expressions, the final result of joining two faces seemed to be more than a simple sum of the parts, as the respondents managed to see emotions that were not supposed to be there, or failed to see the ones that, in terms of drawing, were parts of the expression.

While the labelling of the primary emotions is uncontroversial, this is not the case for the complex emotions. McCloud's labels may in some cases have confused participants instead of helping them. Ideally, any follow-up tests should try to avoid using verbal labels (as we did for Task 2).

Of course, faces are very important cues for the identification of emotions. But neither in comics nor in real life are they the only source of information. For one thing, body postures and gestures can be very informative. One of us saw the wordless 'André y Dorine' in Madrid (performed by Kulunka Teatro on 3 October 2017) in which the protagonists wore huge masks throughout the performance. To the extent that emotions were visibly represented, it was only their bodily behaviour that presented the pertinent cues.

To address the issue of individual differences in reading emotions from faces, future research endeavours might pair comics-based tasks with one or more tests that might reflect these individual differences. For instance, one might employ the ‘Reading the mind in the eyes’ test (e.g. Baron-Cohen et al., 2001). This would allow us to test correlations between participants’ skills in emotion-related mind-reading and their performance on identifying emotions in drawn faces. Furthermore, compiling an adequate comics corpus for the purpose of observing faces in their contextualized environment might be another step forward in drawing more robust conclusions on the claims examined in the current study. Similarly, including a set of more ambiguous faces, be they from authentic comics contexts, from software components similar to those related to the Grimace Project (2017[2009]), or from photo-realistic media, might shed more light onto the level of difficulty in the process of discerning emotions from drawn faces. Another possible direction of future research is exploring cross-cultural aspects of reading faces from comics, which might exhibit the influence of cultural display rules. This approach has been very fruitful in the realm of psychology (for an overview, see Matsumoto, 2001).

As far as certain types of comics are concerned, the right kind of (primary) emotions is enhanced by the use of ‘pictorial runes’ (Forceville, 2005a, 2011; Tasić and Stamenković, 2017). These cues were of course absent here. Also, we should not underestimate the degree to which, both in real life and in comics, we *anticipate* fellow humans’ or comic characters’ emotions. As Kukkonen (2013) rightly points out, in comics, facial expressions never stand on their own but are embedded in narrative contexts that specify the situation giving rise to the facial expression of a character – and that viewers tend to be acutely aware of. Here, a comics variant of the Kuleshov effect, well known from film, also plays an important role. In the late 1910s and early 1920s, the Russian director Lev Kuleshov conducted several editing experiments. In one of them, Ivan Mozzhukhin, a silent film actor, was filmed in close-up with a neutral expression on his face. The shot of Mozzhukhin’s face was cross-cut with various other shots related to different subject matters (e.g. a bowl of soup, a dead body, a girl playing with a doll, etc.). Kuleshov claimed that it was the editing that made viewers assume that the facial expression changed, which meant that the cutting itself could create the performance. Editing the neutral face together with a bowl of soup made viewers see the face as hungry; when juxtaposed with a frame featuring a dead body, it was interpreted as mournful, while a combination with a frame depicting a girl playing made viewers see the face as exuding paternal joy. In all these instances, viewers had seen the same face (Bordwell and Thompson, 2012: 227–228; Prince and Hensley, 1992). Here, again, viewers’ identification of emotions in characters’ faces turns out to be governed to a considerable extent by what emotions they *expect* to see.

On the whole, representing emotions by means of drawing or otherwise depicting stand-alone faces appears to be difficult and unpredictable, mostly due to the fact that such a task is challenging in other spheres of life as well. It

is hard to set boundaries between emotions as they frequently mix and overlap; even when they are simple, they can still be tricky to describe. The complex interaction of facial expressions with body postures, gestures, pictorial runes in the service of cueing emotions makes ecologically valid experimental testing a daunting, if not impossible task. In more photorealistic forms of art, the issue can get yet more complex (e.g. Faigin, 1990). Even in the medium of comics itself, different levels of detail (see Gronsteen, 2003; McCloud, 1993) can impact on the process of depicting emotions. In the notes related to the chapter 'Stories for Humans,' McCloud (2006) says that 'faces are machines.' Nevertheless, he also states that faces are subtle and that 'emotions that govern them are subtler still' (p. 125). From the creation side, faces might appear to be machine-like, but our results show that emotion subtlety dominates the reception side of the process.

Therefore, suggesting easy solutions or simple formulas should generally be avoided. McCloud's proposal was a brave one, and a significant one, as it started the discussion and made us think about how hard it can be to deal with emotional content in comics. Bearing this in mind, with this article we hope to stimulate more research in the area of facial expressions in comics and we hope that more scholars will decide to tackle the difficult issues stemming from attempts to adequately represent, or recognize, emotions in comics.

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