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Creating Tomorrow

Why Buttons Matter: Repurposing Facebook's Reactions
for Analysis of the Social Visual

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Studying images on social media introduces several challenges that relate to the size of data sets and the different meaning-making grammars of social visuality; or, as aptly pointed out by others in the field, it means "studying the qualitative on a quantitative scale." Although cultural analytics provides an automated process through which patterns can be detected in many images, this methodology doesn't account for other modalities of the image than the image itself. However, images circulating social media can (and should) be analyzed on the level of their audience. Bridging the study of platform affordances and affect theory, this article presents a novel methodology that repurposes Facebook reactions to infer collective attitudes and performative emotional expressions vis-à-vis images shared on the large Syrian Revolution Network public page (+2M). We found visual patterns that co-occur with certain collective combinations of buttons, displaying how sociotechnical features shape the discursive frameworks of online publics.

Keywords: visual methodologies, affect theory, social media, digital methods

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Contemporary practices of affective expression on social platforms encompass the use of social buttons (Bucher, 2012) that, in turn, inform the algorithm of the feed. Such buttons first and foremost serve the commercial interests of platforms (Gerlitz & Helmond, 2013). However, as we will argue, they can also be repurposed to advance the study of images on social media. As reactions are affectively charged through their design, depicting universally known expressions of emotion, we have set out to develop a novel methodology with affect theory as a framework. We study affective publics potentially present in audiences of posts on the Facebook page that served as our case study: the Syrian Revolution Network (https://www.facebook.com/Syrian.Revolution) with 2M+ followers at the time of conducting the research. This page was the foundation of what later became a Syrian opposition organization. It was created in February 2011, at the onset of the Syrian uprising in the wake of the Arab Spring. We selected an activist page because emotions play an important mediating role in the onset of activism (Feldman & Hart, 2016). Moreover, a study into pathways to protest, Stürmer and Simon (2009) found that anger can be a precursor of increased willingness to protest. Worry and hope have been found to be important predictors of support for policy action (Smith & Leiserowitz, 2014).

In the context of affect theory, we chose this page because it is one of the largest public Facebook pages, in terms of follower numbers pertaining to a structural issue that is in and of itself highly emotionally charged. Affective publics are defined as networked public formations, mobilized and connected (or disconnected) through expressions of shared sentiment (Papacharissi, 2015). According to Kuntsman (2012), "digital technologies are fundamentally changing the terrains of warfare and conflict," contributing to "cybertouches of war" (pp. 2–3). Through allowing a very immediate emotional response toward content, reactions make visible how individual bodies self-report affective charge of investment, of being touched (Cvetkovich, 2003, p. 49). In the case study of the Syrian Revolution Network page, this means being touched by images of war. Thus, the way we experience and remember war and conflict is changing through the affective fabrics of digital culture (Kuntsman, 2012, p. 3). Affective attunement on social platforms takes place through engagement with (visual) messages that range from liking a Facebook post to generating a meme, to reappropriating news images (Knobel & Lankshear, 2007; Mielczarek, 2018; Papacharissi, 2015). Such practices, according to Papacharissi (2015), are "indicative of civic intensity and thus a form of engagement" (p. 25). Whereas the study of affect has been largely dealing with textual content, we expand on this by shifting the focus to visual analysis. This shift to the visual in studying affect is of paramount importance as it is shown that images trigger stronger emotional reactions than written or spoken information (Barry, 1997; Grabe & Bucy, 2009). Existing visual communication literature argues that images are "especially powerful in transmitting realism and emotional appeal" and that "because visuals are processed via emotional pathways in the brain, they are inherently affect laden" (Grabe & Bucy, 2009, p. 8). The power of images (Dahmen, Mielczarek, & Morrison, 2018) in both instigating action as well as in emotional impact is shown in earlier research (Ewbank et al., 2009).

The collective use of reactions buttons, and the combinations of buttons,[1] signifies ways in which images are audienced within the sociotechnical affordances of Facebook (Rose, 2016). We present a novel methodology in which reactions are repurposed to study the sociotechnical "audiencing" of images. This

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[1] Individual users can only choose one button. We study the collective use of buttons by a post public, such combinations of multiple (oftentimes two co-occurring) buttons pointed us to certain images.

study answers the following methodological research question: How to advance the study of social media images, assessing both image content and the ways in which this content circulates within emotive sociotechnical affordances of Facebook? The questions underlying this study are: How are reactions used collectively? How do image characteristics distribute across the different reactions? What can ambiguous collective responses—collective combinations of buttons—reveal on affect and the emotional expressions of the post public?

The current study is built on digital methods as portrayed by Rogers (2013), who necessitates the use of digitally native objects to understand how social platforms influence and organize social and cultural life. Visual communication is practiced in relation to specific social settings or audiences; Schreiber (2017) states how this audience awareness plays out within the affordances of software that coconstructs processes of editing, distribution, sharing, and affirmation. This article furthers the understanding of how images are audienced within platform affordances, bringing together platform studies and affect theory. We look at the affordances of reactions, making the argument that Facebook pages are affective repositories. We discuss this through the lens of emotion theories. We then outline the mixed-methods approach used in studying affective reactions on Facebook through images on the Syrian Revolution Network page. Finally, we conclude that certain visual imagery co-occurs with collective combinations of reaction buttons.

The Affective Affordances of Reactions

Social network sites (SNS) are networked communication platforms in which participants have uniquely identifiable profiles that consist of user-supplied content, content provided by other users, and system-provided data; can publicly articulate connections that can be viewed and traversed by others; and can consume, produce, or interact with streams of user-generated content provided by their connections on the site (boyd & Ellison, 2013). Through these interactions, affective processes and displays enable online publics to bond (Duguay, 2016). As mentioned, platforms afford such publics to bond in different ways, one of these being the "lightweight" engagement of clicking a button. To be sure, we distinguish affect from emotion: affect is seen as the "moving force" that precedes emotional expression (Papacharissi, 2015). As such, it is situated within human interiority and cannot be observed (Massumi, 2010). However, we can observe self-reported emotional expressions. The word "emotion" finds its roots in two Latin words, *ex* and *movere*, meaning "to stir up" or "to disturb" (Donada & Nogatchewsky, 2009). The nature of emotions is complex and, in research, different definitions are used (Bagozzi, Gopinath, & Nyer, 1999). Interpretations range from emotions as processes in continuous change over time (Ellsworth & Scherer, 2009) to global feelings (Lee, Chamberlain, & Broderick, 2007) and, depending on the theoretical framework used, there might be different interpretations of the relationship among emotion and cognition, individual and social group perspectives, and basic or composite emotions.

The Social Affordances of Buttons

The function of social buttons in general reflects a practice introduced by bloggers: using the number of subscriptions as a measure for the quality of a blog (Gerlitz & Helmond, 2013). Later, the social web introduced buttons that have a similar function, indicating whether content is worth paying attention to. The sum of likes a post generates is now indicative of its relevance to platform users. By

implementing reactions, Facebook extended the ways in which content can be qualified affectively. In the past, the positivity of the like button was celebrated among marketers, which stressed the need for light-hearted and positive content to get people in a buying mood (Wahl-Jorgensen, 2019). Counter to this, in 2012 a campaign on Facebook demanded adding a dislike button, which garnered three million signatures (Wahl-Jorgensen, 2019). In a meeting held in 2013, programmers proposed introducing a "sympathize" button (Meyer, 2013). Thereon Facebook prioritized building a more nuanced palette of human emotions (Wahl-Jorgensen, 2019). In October 2015, it became clear that the like would get company of, initially, six emoji-based buttons that were rolled out in 2016. Facebook's choice for the emojis of the reactions buttons was based on what comments and reactions to posts were most commonly and universally expressed across Facebook.

Emojis are hybrid representations of emotions. The "in-betweenness" lies in the meaning of the word "emoji," which is "picture character" in Japanese, where "e" stands for picture and "moji" for letter or character (Danesi, 2016). Indeed, emojis work as picture characters that label content, be it textual or visual. Meanings of each picture character are associated with oversimplified positive and negative emotional states (e.g., love, haha, wow, sigh, grr), but are ambiguous enough to explain a wider range of feelings—for example, ironic reactions. Although emojis can be interpreted in various ways, a recent study found that in only 25% of the times participants disagreed on the sentiment expressed by an emoji (Miller et al., 2016). A recent study found that Facebook reactions correlate with the sentiment expressed in the comments that accompany a post (Tian, Galery, Molimpakis, & Sun, 2017), making reactions a decent indicator for determining sentiment toward a post. Gerlitz & Helmond (2013) claim that social buttons both prestructure feelings and enable possibilities of expressing affective engagement with Web content, while, at the same time, measuring and aggregating these responses. Following that, we refer to reactions as an attempt by Facebook to "metrify" a part of what earlier might have been conceived as nonmeasurable: emotions evoked in users. Seen in this way, reactions work as a simplified questionnaire for self-reported emotions in social media users who are asked to identify their own attitudes toward content.

Facebook Pages as Affective Repositories

We understand social platforms—and Facebook pages—as affective and sentient archives of feeling (Cvetkovich, 2003). Drawing on this notion, Pybus (2015) examines how affect accumulates within user profiles and moves people, at times constituting affective publics. As said, we cannot detect affect residing in individual bodies, rather we detect networked affect constituted by shared emotions. Because of the social platform context of this study, mediated emotions should be regarded as relational interpretations of affect experienced in individual bodies (Wahl-Jorgensen, 2019, p. 8). As such, we can understand the use of reactions as a practice that is shaped by relational interpretations of affect. In understanding such relational interpretations of affect, it is important to point out how, on social platforms, people "stage" their use of reactions, aware of being monitored and scrutinized by others (Mortensen & Trenz, 2016). As opposed to user profiles, we argue that Facebook pages—being archival in nature—are repositories of feelings and emotions. These feelings and emotions are expressed through text but also through images. Iconographies differ throughout pages based on the workings of affective economies, the latter described as economies in which the power of emotions accumulates through the online circulation of texts (Ahmed, 2004). In the scholarly attempt to understand the accumulation of

affect through content circulating social platforms, we contribute through shifting the focus from text to images. Ahmed (2004) points out that texts have emotionality. Exploring emotions as the site of contact between the individual and the social, Ahmed suggests that affectively charged figures of speech (such as metaphors or metonyms) are what make texts "moving"—generating affect. But emotionality of texts, according to Ahmed, also lies in their capacity to name and perform different emotions, such as disgust, fear, hate, or shame. In determining how images might evoke affect, we therefore look into their "figures of speech": What are images symbolizing? Following Ahmed, we also account for the emotions that are explicitly referred to in images and in accompanying post texts.

We studied image content in relation to metadata garnered through the reactions button feature. Studying how reactions are used as responses to different types of contents is far from trivial. Dennis (2018) outlines how slacktivism is the result of technological determinism that created a false dichotomy: "either social media will usher in a new era of mass participation and political equality or it will enable a dystopian Orwellian future" (p. 26). Although a click of a button will not change the world, it is part of a continuum of participation (Dennis, 2018). Following Dennis (2018), we situate reactions as a technological affordance that networks visual content in advocacy spaces in such a way that they coproduce the discursive frameworks of affective publics (Papacharissi, 2015).

The Cybertouch of War, Performativity, and Emotional Alignment

In 2010, Kunstman coined the notion of the cybertouch of war, referring to the mediation of wars and conflicts and the affective regimes that emerge in cyberspace at the time of imperial invasions, wars on terror and globalized mediascapes. We understand the use of reactions as self-reported affective investments or "cybertouches of war." An accumulation of individuals reporting "being touched" is understood as collective affect in what potentially can amount to the construct of digital affect cultures (Döveling, Harju, & Sommer, 2018). Such cultures come into being when emotional alignment and resonance constructs atmospheres of emotional and cultural belonging. Because reactions are self-statements of emotions, we might infer that they cocreate emotional alignment or divergence and thus shape a particular digital affect culture. Sunstein (2007) describes "cyber cascades" (p. 84): Online audiences are susceptible to the sway of popular opinion as they seek to secure the approval and validation of others. This aligns with what Mortensen and Trenz (2016) argue about the online spectatorship of suffering: Moral spectatorship is taking place in a public space and therefore it is observed and scrutinized by others (Mortensen & Trenz, 2016). This results in users monitoring emotions shared by others, which, in turn, results in users "staging" their reactions to align with or divert from the general emotions shared. We thus do not study actual felt emotions within individuals, but rather cultural alignment of individuals that engage in performative acts of emotional expression. Collective affect is communicated through expressions of emotions. Although the grid of five basic emotions that Facebook provides could never cover the complexities of actual emotions, the ways in which these buttons are used collectively can reveal more than "just" the basic emotion represented in the dominant emoji of choice. This complexity is, we argue, apparent in instances where the collective use of the buttons points to ambiguity. Often, collectively, two buttons are used in the same intensity. Before we delve into this, we need to go into emotion theories.

Emotion Theories

When looking into theories of emotion, nature, and sequence of emotional responses, two main theoretical underpinnings stand out: the cognitive appraisal theories of emotions (Ellsworth, 2013; Frijda, 2007; Lazarus, 1991; Roseman, 2013; Scherer, 2009), framed in cognitive psychology, and the affect as information theories, rooted in social psychology. The cognitive appraisal theory assumes that different people can have different types of emotional reactions (as well as no reaction at all) to the same stimulus (i.e., emotions are subjective; Bagozzi et al., 1999). In this interpretation, an emotion is therefore "a valenced reaction to events, agents or objects," (Ortony, Clore, & Collins, 1988), and cognition determines the kind and intensity of the emotional response. Furthermore, emotions are believed to arise and diversify according to the importance of the stimulus in respect to individual goals (Lazarus, 1991, as cited in Gross, 1999). Finally, motivational or situational states, probability, legitimacy, and agency (Roseman, 1984) also influence the appraisal process. Through this process, an expressive response, a subjective experience, and a physiological response occur (Hockenbury & Hockenbury, 2007). Conversely to cognitive appraisal theories, the affect as information theories—based on the Affective Infusion Model of Forgas (1995)—are about affective states that are present before someone's emotional appraisal and about how these preexisting states can affect the appraisal itself (Clore & Huntsinger, 2007).

The assumption that situational states (in appraisal theories) and preexisting affective states (in affect as information theories) might influence punctual individual reactions, opens up possibilities for the emergence of the concept of collective emotions (i.e., "the synchronous convergence in affective responding across individuals toward a specific event or object"; Von Scheve & Ismer, 2013, p. 406). Kessler and Hollbach (2005) emphasize that the "distinctive feature between individual and group-based emotions is that individual emotions are elicited by events concerning one's personal identity whereas group-based emotions are elicited by events concerning one's social identity as a member of a particular group" (p. 677). The phenomenon of "contagion," for instance, is theorized as one of the key aspects of collective affect. Contagion happens when there is a "tendency to automatically mimic and synchronize facial expressions, vocalizations, postures, and movements with those of another person and, consequently, to converge emotionally" (Hatfield, Cacioppo, & Rapson, 1992, p. 153). This phenomenon might be considered when addressing Facebook pages, since the public availability of the already stated that reactions might influence the behavior of any reacting member, in a sort of collective effervescence (Durkheim, 1912), especially when values and attitudes toward the stimulus are shared in the community. The aforementioned "cyber cascades" (Sunstein, 2007) and Döveling and colleagues' (2018) emotional alignment in digital affect cultures expand on this.

Independently of the individual or collective perspective, emotions can be classified according to their structure. Theories of emotional structures can be roughly divided into three approaches: the categorical theories of emotion (Izard, 1977; Plutchik, 1980), the dimensional theories (Izard, 2009), and, based on the former two, a third and more recent approach: the hierarchical theory (Laros & Steenkamp, 2005). Categorical theories (Hosany & Gilbert, 2010) assume that emotions are a limited number of discrete entities and that they represent "unique experiential states that stem from distinct causes and are present from birth" (Scuttari & Pechlaner, 2017, p. 45; Izard, 1977). The idea of emotions as discrete entities links back to the concept of basic emotions—that is, categorically discrete entities with distinctive psychological

profiles and facial expressions (see the work of Ekman & Friesen, 1969; and later works of Ekman & Cordaro, 2011; Izard, 2011; Levenson, 2011; Oatley & Johnson-Laird, 1987). An alternative approach to categorical theories implies recognizing that there is more than one emotion that can be experienced at the same time (Lee et al., 2007): the dimensional approach. Dimensional theories claim that emotions are not classifiable into a limited number of affective states, but rather an infinite range of emotional states evaluated according to a multidimensional perspective. What is important is that "each emotion occupies a unique region in this multidimensional space" (Ellsworth & Scherer, 2009, p. 574). This might suggest that, although having the possibility to click just one button, Facebook users experience a mix of different feelings, which might not be discrete entities to choose from. They would then use reaction buttons as proxies for their emotional state and not exact representations of it.

A third and more recent perspective on structural classification of emotions attempts to reconcile categorical and dimensional theories: the hierarchical theory of emotions (Laros & Steenkamp, 2005). According to this last perspective, there is a superordinate level of emotion (positive versus negative affect), a basic emotion level (four basic positive and four negative emotional states[2]), and finally a subordinate level (42 classified emotions). Each user is forced to choose one reaction, thus selecting the emotion with the highest valence and arousal. Based on the last perspective, this selection might relate to the basic emotion provoking the highest arousal; however, that does not exclude that multiple and more complex combinations of basic emotions are felt. Finally, we want to stress the importance of pointing out that the type of emotion expressed on Facebook is mostly shaped by what Facebook provides its users: the button grid constraints expressed emotions into a predefined set of choices, that might (or might not) be exhaustive to express actual felt emotions by users. The key difficulty with this is because the presence of the "like" button, which superseded the reaction buttons by a decade. This button can be interpreted in many ways, and it is thought to collapse a wide range of emotions. Although we recognize this limitation, we do not discard the valuable insights that are given by those who do make use of the reaction buttons. Essentially, the Facebook reaction grid is a "forced" model of dominant affect, as people are forced to choose an emotion within given affordances. So, although there are other theories that are less focused on categorical principles, such as the hierarchical theory, the affordances of the platform assume that emotions are a limited number of discrete entities with distinctive psychological profiles and facial expressions. Despite the grid falling short in capturing individually felt emotions, studying images that were responded to by strong co-occurrences of two buttons is valuable, as we can trace patterns in these images that might point to the other emotions, not (fully) represented by the given emoji buttons.

Methods: Reading Images in the Framework of Button Co-occurrences

The study followed a quantitatively driven sequential mixed method design (Greene, 2007), according to which quantitative metrics were used to assess stated emotions, then qualitative interpretations of visual content were introduced to understand more complex combinations of the stated feelings. This bipartition of methods (quantitative and qualitative) reflects the twofold function of reaction buttons: On the one hand, the quantitative evaluation of correlations between different emotions within the grid assesses

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[2] In the hierarchical theory, the basic emotions under positive affect are contentment, happiness, love, and pride, and under negative affect, these are anger, fear, sadness, and shame.

the correlation patterns among different emotions related to the same content; on the other hand, the qualitative assessment of this content reflects the vernacular of specific communities around specific stimuli. Hence, the work consisted of data mining and statistical analysis, visualizing co-occurrences of images and buttons, and qualitative image post analysis. The qualitative analysis was based on the idea of a data-information-knowledge continuum, outlined by Masud, Valsecchi, Ciuccarelli, Ricci, & Caviglia (2010), where visualization is referred to as a design perspective with means to achieve declared purposes. The authors quote Baule, Ciuccarelli, Ricci, & Scagnetti's (2010) statement that visualizing a complex problem is not just a quantitative question; it also deals with the visual narration of values and qualitative data. Therefore, in their model, they suggest not to define the visualization by the technology and quantitative abilities, but to adapt it to the aim and context.

By querying the interface and mapping search counts, we could establish that the Syrian Revolution Network page is, in the space of revolutionary ideology pertaining to the Syrian War—one of the largest public pages on Facebook—at least at the time of conducting this study. We mined our data from the Facebook page using the Netvizz application developed by the Digital Methods Initiative (Rieder, 2013). We gathered all posts from the day that Facebook launched the reaction buttons (February 24, 2016) through to June 27, 2017. Following data cleaning and filtering for photo-only posts, we ended with a final data set of 6,409 posts. The posted images were then downloaded using batch download software. Since some of the analyses required deeper readings of smaller data, we also used a sample out of the full data. A representative sample (N = 363) was drawn based on a calculated sample size of 95% confidence level of the total of 6,409 original posts. To test for representativeness, we drew a one-sample t-test based on the variable engagement. This variable reflects the total amount of clicks, shares, and reactions to a post and is therefore a perfect summary of the different variables to base a comparison on. The t-test showed that the sample mean (M = 2526.16, SD = 2686.06) did not significantly differ (t = 0.675, p = .500) from the full data set (M = 2631.72, SD = 2905.34). Therefore, we can assume a representative sample. Based on the above described random sample, we visualized the relational structure of images and buttons (see visualization in Appendix Figures A1, A2, and A3). The sample file was imported into Gephi, using each image and reaction as nodes, and the number of times each reaction appeared on each image as edges. The reactions nodes were sized through user frequencies. We examined the distribution of visual content characteristics across the reactions and combinations thereof to get a sense of the larger sample before we would dive into a selection of images to discuss further.

We used IBM SPSS v24 and Stata v13 for the statistical analysis. We employed a Spearman's correlation to examine the correlations between the reactions and how the different reactions cluster together. When there was more than one dominant reaction, it was usually accompanied by one other button (a bimodal distribution), rather than a mix of several reactions. In other words, there was a clear mixing of two emotions. Therefore, Spearman's was more appropriate over other tests. Where the audience of a post shows high ambivalence in the choice for reactions, we infer that the image evokes more complex emotions experienced in the public. This ambivalence also provides clues on what the visual stimuli were for reactions to strongly co-occur in one post. We chose to analyze posts with most correlated mixed reactions, as they show strong ambiguity.

For the qualitative assessment of images, we selected photos that received a combination of most correlated reactions for this page: sad and angry, and sad and love. To calculate the ratio of combined reactions in images, we used the following formula: Reaction 1/Reaction 2 * 100. We analyzed all the photos that got between 90% (Reaction 2 is higher than Reaction 1) to 110% (Reaction 1 is higher than Reaction 2). Each image was qualitatively analyzed, identifying image objects, subjects, and protagonists; together, these elements constitute "figures of visual speech" that hold affective potential. As such, content elements alone do not express the full message of the image; we contextually analyzed their sociovisual narratives through the textual elements of the posts. As the majority is in Arabic, we used automated translation (Google), which was double-checked by a native speaker.

Findings: Reading Images in the Framework of Button Co-occurrences

Firstly, we answered the question of how the buttons are used on the collective level. We examined the co-occurrences of different reactions in Facebook posts to investigate their use for self-reporting emotions in a social context. Table 1 presents the descriptive statistics of the reactions' metrics. Excluding likes (because of their emotional ambiguity), the most dominant reaction to images on the Syrian Revolution Network page was sad ($M = 59.05$, $SD = 158$), followed by angry ($M = 21.95$, $SD = 59$), reflecting the sufferings and rebellion impulses for the revolution itself and suggesting a sort of indignation toward the posted contents.

Table 1. Descriptive Statistics of the Different Reactions, N=6,409.

	Frequency	Minimum	Maximum	Mean	SD
Like	12,525,629	92	28,868	1959.58	2099.218
Love	139,632	0	1,017	21.84	33.39
Wow	8,694	0	145	1.36	3.54
Haha	54,150	0	1,923	8.47	34.034
Sad	377,436	0	2,621	59.05	157.974
Angry	140,285	0	914	21.95	59.428

We then determined whether most posts had a dominant reaction. Posts with a 70% consensus on a single reaction were determined to have a dominant reaction. Approximately 48% of posts did not have a dominant reaction, indicating that nearly half of the posts elicited more than one reaction. We then examined the distribution of each of the reactions and removed outliers. We then tested for violations of normality with the Kolomogrov-Smirnov test. Since the distributions of all the variables were not normally distributed ($p = .000$), we used Spearman's rank correlation since the relationship among the variables was monotonic, and the frequencies indicated a bimodal distribution of reactions, rather than a combination of three or more.

Table 2 shows the Spearman's correlations among the reaction buttons as they were used in the Syrian Revolution Network page. The table shows that the negative emotion reactions (sad and angry) were highly correlated ($rs = .738$, $p = .000$). On the other hand, the positive reactions (love and haha) go together but were more distinct ($rs = .444$, $p = .000$. The seemingly neutral wow reaction button was stronger correlated with the positive emotions, love ($rs = .419$, $p < .000$) and haha ($r = .469$; $p < .001$), compared with the negative emotion, angry ($rs = .099$; $p < .000$).

Table 2. Spearman's Rho correlations. N = 6,392.

	Love	Wow	Haha	Sad	Angry
Love	1	.419**	.444**	−.145**	−.350**
Wow		1	.469**	0.015	.099**
Haha			1	−.152**	−0.001
Sad				1	.738**
Angry					1

** Correlation is significant at the 0.01 level (2-tailed).

All in all, reactions to images often appeared bimodal, rather than having one dominant response. We find support that positive and negative reactions are correlated. Therefore, although sad was a dominant reaction overall, there was a mixing of emotions for different images.

Zooming In: Hope and Resilience Versus Anger and Frustration

We zoomed in on images that garnered highly correlated reaction responses to see what characteristics lead to this ambiguous response. If we see patterns in image content co-occurring with certain combinations of buttons, we can answer RQ3. In total, 46 images matched the sad-angry combination (23 with sad being the more dominant reaction and 21 with angry as more dominant and 2 being equally dominant) and 22 love-sad combinations (12 with sad as the dominant reaction, 9 with love and 1 equally dominant). The relational visualization of the sample (see Appendix, Figure A2) shows how depictions of children are dominant in the zone between the sad and angry nodes. Between love and sad we see more diverse image content, ranging from children to sign holders and adult casualties of war. In the next section, we discuss how images in both combinations of reactions evolve content wise, when moving away from the 100% ratio point.

From the 21 angry and sad posts, where angry comes in first (with sad logically following suit) we see an interesting pattern: 12 of 21 images depict fire and rubble as a result of bombardments. This is the most common content characteristic in the angry first images. The 100% ratio images ($n = 2$), consist of a depiction of a vehicle on fire and a depiction in which there is fire in the background and a young man in the foreground, seemingly taking a selfie (see Figure 1). The latter image is combining the common visual symbols associated with angry (fire, rubble, bombardments) with a human element: a man in this case. In 7 of 23 sad first posts we see this human element returning. Humans are much less present in angry first posts ($n = 6$ of 21) and a large proportion of the people that are depicted in these "more angry" posts, are politicians being mocked ($n = 4$ of 6) implying how politicians seem to garner more anger, something that might be expected.

Figure 1. Combining the common visual symbols associated with
angry (fire, rubble, bombardments) and sad (people).

Sad-first images (N = 23) with angry following second, show similar content as the angry-first images (fire and rubble in 13 images). However, when accounting for translations of the accompanying texts, the rubble images with sad as a first reaction, are of bombarded mosques (see Figure 2) that might account for the fact that sad slightly wins in these cases. The destroyed religious houses seem to evoke more feelings of loss, and anger gets pushed to the background. From the fact that images of bombardment, fire, and other consequences are associated with significant collective combining between sad and angry, we derive that posts depicting a destroyed mosque, a symbol of Islam, serve as stimuli that appeal to subordinate emotions in users. Namely frustration and indignation seem to be weighed against each other when choosing to hit angry or sad. Fire and rubble being more inanimate, collect slightly more anger and images with more humane or religious symbols ignite more indignation.

***Figure 2. Religious symbols are more apparent when we reverse
sad and angry (sad first in correlating posts).***

Helplessness and frustration, being subordinate emotions that fall under the basic emotions of anger and sadness (Laros & Steenkamp, 2015), are particularly vivid when looking closely to a post with a 100% ratio of sad and anger: the image of a young man taking a selfie with bombardment fire in the background. In the images of the love and sad combinations ($N = 22$), no clear differences were found between images where sad comes in first ($n = 12$) or love as first ($n = 9$). The most common visual characteristics in these posts were: male rebels ($n = 7$) and children ($n = 8$). Remarkably, 7 out the 8 images depicting children, show them in the context of festive events, such as Eid al-Fitr. When accounting for the texts that go with these images, all set out how children are the symbols of hope and life for this page public.

Figure 3. In posts in which love and sad go together, the dominant visual story is about children (love) amid rubble (sad).

The remaining seven images generating both love and sadness were varied in visual content. However, all post texts in this correlated zone send a coherent message: solidarity for the Syrian revolutionary cause. By accounting for the accompanying texts, it can be derived that children convey a message of hope. Hope is symbolized by (at times, smiling) children depicted in the context of festivities and symbols of play (see Figure 3), inventiveness, and resilience: we see a Ferris wheel, inventive household devices made from exploded bomb material). The images of rebel fighters go with texts that convey support and solidarity for their cause. Three of the seven images depict rebels asleep in uncomfortable places, sending a message of hardship and resilience. Diverging images depict a tower that is alight, in solidarity with Aleppo, the revolutionary flag, and people celebrating with a running buffet amidst rubble—again pertaining to resilience. The fact that both sad and love are used in the latter can be explained by the fact that there is a festive event (love) amidst rubble (sad). When linking the visual and textual content of the sad and love posts to the subordinate emotions under the basic emotions sadness and love, we may derive that warm-heartedness (love) and helplessness (sadness) seem to be weighed against each other when reacting. In sum, for the Syrian Revolution Network page, recurring visual objects that get contextualized with reactions usage of love and sad are children, associated with festivities and play, and rebel fighters, associated with elements of their hardship. Anger and sadness go with rubble as consequences of bombardments, destroyed religious buildings, and politicians.

Discussion: Ambiguous Responses and Subordinate Emotions

In this article, we present a novel methodology that repurposes Facebook reactions to infer collective attitudes and self-stated, performative, emotional expressions vis á vis images shared on the large Syrian Revolution Network public page (2M+). We found patterns in image content that co-occur with certain combinations of reaction buttons, displaying how sociotechnical features shape the visual discursive

frameworks of online publics. Although merely a click of a button, through reactions, individuals can, performatively, signify affective investment in a post image. Visual patterns that co-occur with certain buttons or combinations thereof hold the potential to reveal attitudes and emotional alignment toward the images, laying bare digital cultures of affect (Döveling et al., 2018).

Facebook offers a simplified grid of emotional statements and makes available only one choice. This obliges users to make possibly more complex, emotional states converge into one predefined emoji. This technical limitation is of value to the academic study of "button behavior" and collective emotions in general. As we gather reactions data and study how some buttons show a tendency to go with others, we see how button usage collectively reveals the oversimplification of the button grid to serve individual users the full palette of human emotions. Although the categories theorized in Laros & Steenkamp (2005) are not identical to those emerging from the empirical study, our results seem to underpin the theory of hierarchical emotion structures. Users in the Syrian Revolution Network page are found to be more uniform in their experiences of positive emotions, resulting in more distinct usage of the positive buttons (love and haha), although their experiences of the negative emotions are more complex, resulting in a collective combining of the negative valenced sad and angry buttons.

We could derive from the image content that was characteristic for patterns found in certain collective button combinations that subordinate emotions, namely frustration, helplessness, pity, and indignation are visible through sad and angry. The content of posts that associate with correlations between sad and love and sad and angry also serves to explain how and why there is a collective combining of multiple buttons. When linking the visual and textual content of the sad- and love-correlated posts to the subordinate emotions under the basic emotions sadness and love, we could derive that warm-heartedness (love) and helplessness (sadness) seem to be weighed against each other when reacting on posts. In these cases, it seems that a clear polarization between positive and negative valence is somehow less visible. When relating the visual and textual content of posts to the hierarchical structure of emotions, we found that rubble and fire, and (injured and dead) children (distinct usage of the sad button) are the dominant visual topics in the negative affect of the Syrian Revolution Network. Where rubble and fire are eliciting a much more ambiguous user response between sad and angry, conveying more subordinate emotions such as helplessness, frustration, and indignation. The positive affect is visually dominated by male rebel fighters (distinct love usage) and children in a festive or playful scene (correlated sad and love), the latter conveying a message of hope. Hope might be denoted as a positive emotion; however, as Lazarus (1991) argues, hope is aroused only in the face of a threatening situation, albeit when a desirable future outcome is deemed possible.

Most notable is the way children get depicted in the resonating posts with a strong correlation between the sad and the love buttons. As opposed to combinations of angry and sad buttons, where children are, at times, graphically portrayed as victims; in the zone between love and sad, children are consequently depicted as resilient. Although they continue their play amid rubble, contrasting resilience and childlike innocence with the tragedy of war, such images serve as coping strategies in times of hardship, providing hope. Overall, the co-occurrence of multiple buttons thus shows distinct visual patterns of how the page public copes with injustice, hardship of rebel fighters and tragedy in general. As noted earlier, a large part of emotions are not represented by the button grid of Facebook. Although studying (image) content that

sparked co-occurring button usage can give us a glimpse in other emotions that are not in the grid, we also must acknowledge that probably a part of the other emotions experienced by users confronted with these images might be collapsed by the likes button. Especially the combination involving the love button (sad and love), could be prone to this. Love sits closer to likes, although the combination with sad makes absorbing button responses by the likes button less probable. This might not apply so much to the sad and angry combinations, as these sit less well with likes. Hence, because of the ambiguity of the likes button, we are convinced that studying the ways in which such responses are absorbed by likes, is an interesting direction for future research.

Conclusion

As relational affect in the context of social media plays out within the affective affordances of the platform, we argue for studying Facebook pages through its platform native features, such as reactions. This study examined the use of reaction buttons on the Syrian Revolution Network Facebook page through the lens of emotion theories. We found that collective usage of reactions, in the context of this page's content, often showed correlations, especially between sad and angry and love and sad. We used a relational approach to determine photos that garnered mixed reactions and qualitatively examined their depictions. Overall, we find that looking at Facebook reactions to images on public pages is an interesting avenue of affect research in the digital realm. The reactions buttons make possible the study of many images circulating a giant platform, doing justice to the way that these images are both audienced and contextualized in a sociotechnical environment. The methodology we set out is by no means exhaustive. For example, it does not account for other ways of engaging with image posts, such as commenting, liking, and sharing. However, this methodology can be adjusted to include metrics that point to other modes of user engagement and behavior, afforded for by the platform at hand.

Through allowing for a very immediate response to visual content, reactions make visible how individual bodies self-report affective charge of investment, of being touched by images of war. Affective publics are glued through (image) content, and when emotional alignment takes place, this signifies or lays bare emotional regimes underlying such publics. By repurposing the platform rank feature of a social media giant—Facebook reactions—for research into the audiencing of images circulating this sociotechnical space, we hope to contribute to the study of social media visual communication.

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Appendix A

Following Decuypere (2019), who states how: "qualitative approaches largely adopt the notion 'network' as a method that allows to trace the complex entanglements by means of which specific practices are constituted" (p. 2), we used a visualization of the relational structures of images and buttons to explore visual patterns in a random sample (tested for representativeness). We were thus concerned with the visual rather than the structural (social network) properties of the visualization and used the visualization to explore patterns and relate the selected images for the qualitative analysis to patterns in the larger sample.
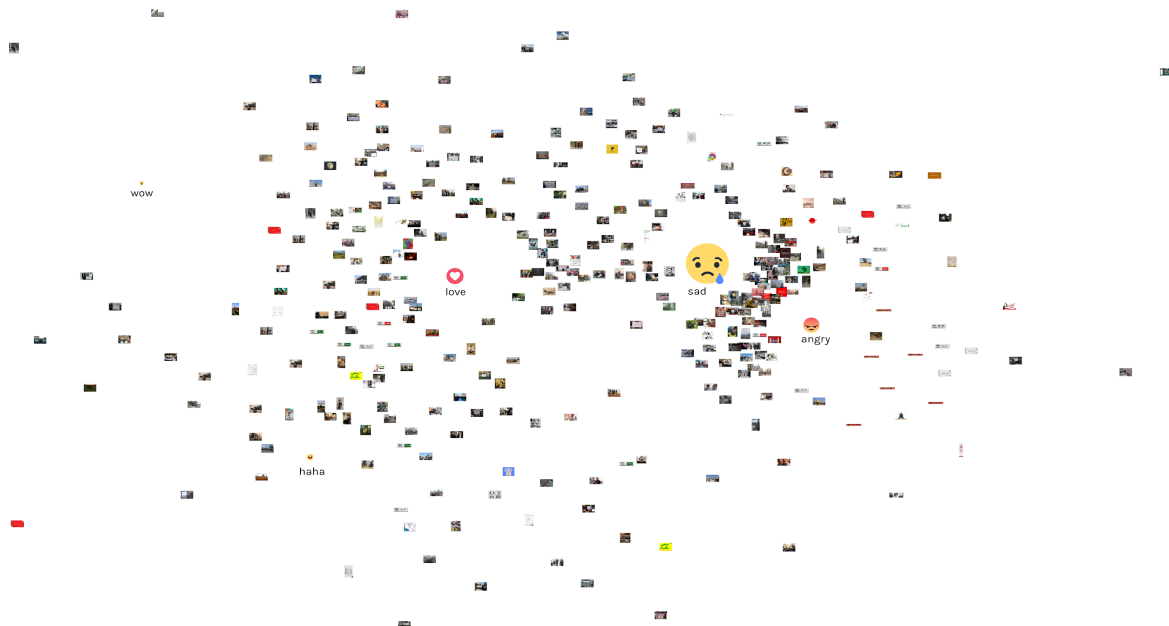
Figure A1. Bipartite map of the distribution of posted images across Reactions. Note that both Reactions as well as images are nodes, where the images are clustered around the Reactions nodes. The edge weight between the two are the Reactions metrics tied to the images. Node size corresponds to the total user frequencies of the buttons.
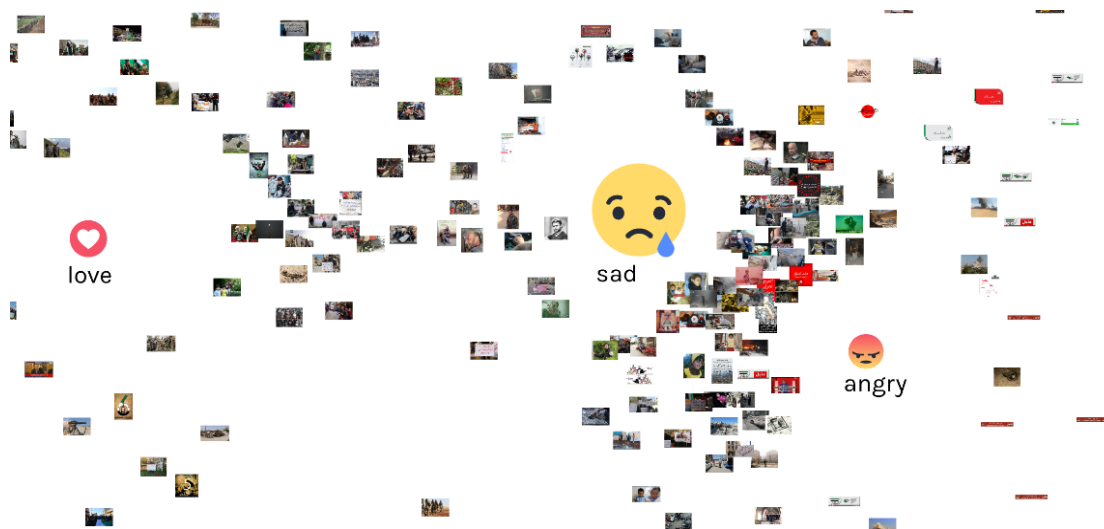
Figure A2. A cropped depiction of the visualization in which images of posts with both sad and angry are more visible. Children were dominant protagonists in this zone whereas we saw more antiregime soldiers and sign-holding activists around the love button, see next crop.
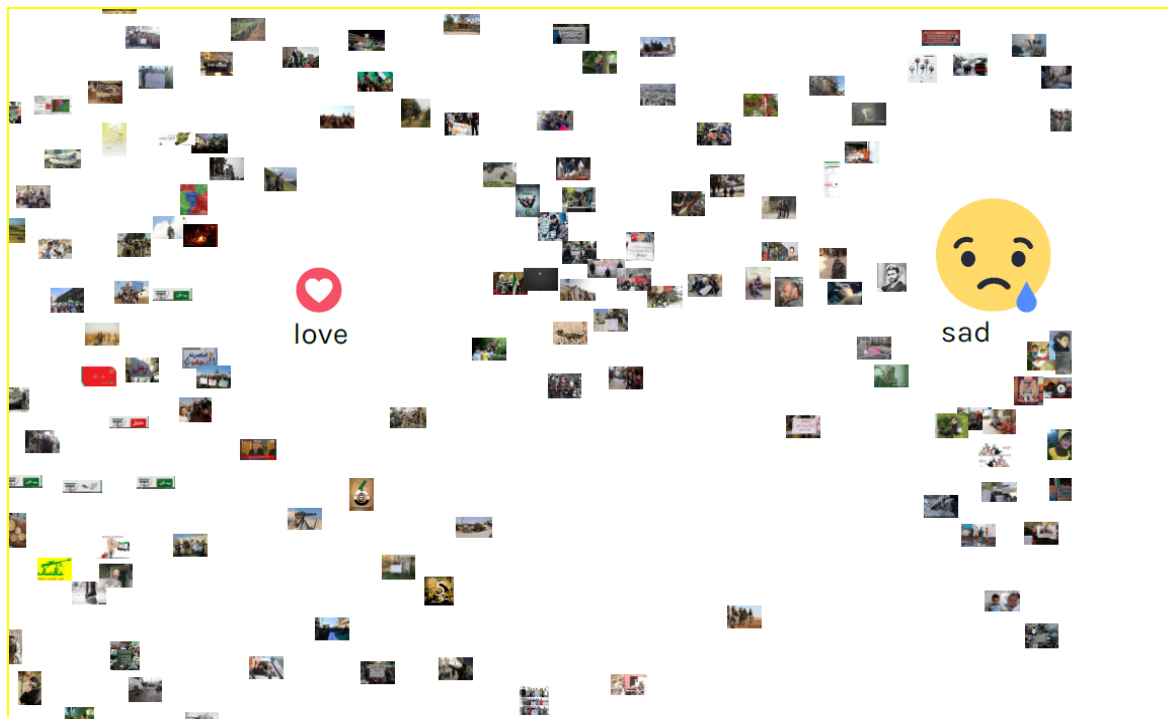
Figure A3. A crop of the zone surrounding and in between love and sad.