

# Action, Emotion, Opinion – A Taxonomy of Human Reactions Expressed in Location-Based Social Media

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## Abstract:

A particular form of volunteered geographic information are data from location-based social media (LBSM), which are social network platforms that include location information into shared contents. Being increasingly used as a data source for geospatial research, LBSM data are applicable also outside science since they open up numerous opportunities. Social media networks are extensively used for expressing reactions towards a topic or an event (publicly or within a particular group of people) by exchanging thoughts, opinions, ideas, feelings etc. Key to any framework aiming for analysing these reactions is a definition of dimensions through which reactions can be characterised including ways of describing (What, Who, Where, When) and explaining (How) (Dunkel et al., 2019).

The dimensions What, Who, Where and When are invariably explored in many research projects dealing with LBSM, although not necessarily all four dimension are considered in combination in each case. Though, the dimension How has been also addressed so far but with a rather specific focus, like on emotions or sentiment (e.g. Hauthal & Burghardt, 2016). Nevertheless, a systematic breakdown what a reaction can be is lacking, i.e. in which ways people can react to events. The presented work aims at that by demerging the term ‘reaction’ and subsequently proposing a taxonomy.

The term ‘reaction’ occurs manifoldly and can describe behaviour or an unpleasant effect, but is also used in chemistry or physics. Within the scope of this work, reactions as a form of human behaviour are of interest. The Oxford English Dictionary defines a human reaction as “any response to an event; something done, felt, or thought in response to a situation, statement, etc.”<sup>1</sup>. Numerous other definitions hold this tripartition, which serves as the basis for the presented taxonomy. The tripartition is depicted in Figure 1.

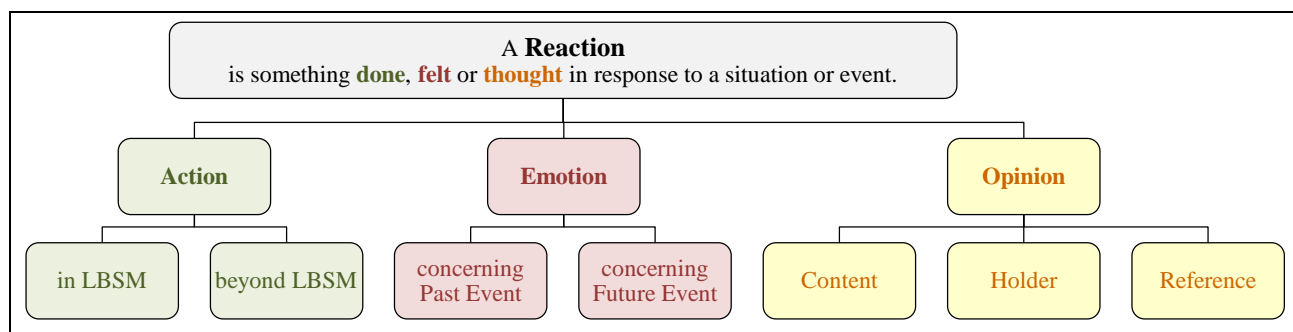


Figure 1. Tripartite meaning of reaction.

An emotional reaction towards an event can be related to a past or a future event. In case of a past event, the emotions are referred to its consequences, which are either affecting the reacting person or others, and depend on whether these consequences are (un)desirable for others or whether expectations related to the consequences for self are relevant and, if so, got (dis)confirmed (Ortony, Clore & Collins, 1988). Emotions concerning a future event can evolve diversely based on the agency of the reacting person (Wahner, 2009).

A reaction can also occur in the form of an opinion, an appraising thought or an attitude. Opinions can be characterised regarding their content (pro, contra, neutral), holder (personal or collective opinion) and reference (public, scientific, legal, judicial, editorial opinion). Often, in LBSM, particular hashtags become established representing an opinion towards a matter and being used by people with the respective attitude (e.g. the hashtag *#voteremain* as a contra expression towards Brexit, prior the referendum on the United Kingdom’s membership of the European Union in June 2016).

<sup>1</sup> <http://www.oed.com/view/Entry/158836>

A reaction towards an event in terms of an action, i.e. doing something, can occur within LBSM or beyond. Actions within social media networks need to be regarded from a technical point of view and can be creating own, original content (e.g. tweeting, posting), reacting to content (e.g. liking, favourite), interacting/associating with content (e.g. replying, commenting, mentioning, following) or spreading content (e.g. retweeting, sharing) (Davis, 2016). These kinds of actions are contained in the metadata of LBSM posts. Moving beyond LBSM content as a reaction to an event can happen in the web (e.g. reading a blog post, signing up for a newsletter, downloading an ebook) or outside (e.g. going to a demonstration, stop smoking). Actions beyond LBSM may in turn be pre-announced or reported in LBSM.

By utilising an application case, the described three kinds of reactions will be studied and visualised cartographically. Possible extraction methods can include emotions recognition for emotional reactions, sentiment analysis or opinion mining for attitudinal reactions, activity modelling for action-related reactions. All these approaches could involve natural language processing, but could also consider emojis appearing in LBSM posts, for example emojis of faces depicting countenances or gestures as an expression of emotions, or emojis of common hand gestures, particularly of thumb signals as an indicator of opinions. Besides serving as input data, emojis will also be deployed as an output for metaphoric map symbols.

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