

Practices of Classification: The Hashtag as Infrastructure for Interaction

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When social media infrastructures are considered from a classic understanding of material, technical things, the cables, data centres, and routers are the focus of observation. Those with a technical understanding of infrastructures are concerned to emphasize the processes that take place ‘underneath’ the interface of social media platforms that make user interactions possible in the first place.¹ For our research perspective, following a rethinking of infrastructures in this context means not only attributing dynamics of ‘infrastructuring’² to these basic material structures, but also looking for infrastructures in social media interactions themselves and to ask how infrastructures emerge from practices and vice versa. Instead of making a dualistic separation between interface and infrastructure, between what is visible or ready-at-hand to the human operator and what lies beyond reach, we would rather draw attention to the interconnectedness between infrastructures and practices. In what follows, we refer to the hashtag as a case study to ask about the interplay between infrastructures, practices, and cultural formations in ways that are overarching and transferable to other contexts. The aim of the paper is to show how an understanding of infrastructures that is not solely focused on the ‘hard’ materiality of technical things can clarify the relation between media *practices* (in our example: of users in social media) and social and cultural movements. The dynamics of infrastructuring are thus understood as processes that produce and structure interactions and make these interactions in their sociality relevant for and connectable to cultural discourses and narratives. From a media studies perspective, hashtags

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- 1 Jason Farman, “Infrastructures of Mobile Social Media,” *Social Media + Society* 1, no. 1 (2015), <https://doi.org/10.1177/2056305115580343>.
 - 2 We refer here to the implications of the concept of ‘infrastructuring’ by Susan Leigh Star and Geoffrey C. Bowker, for whom infrastructures are not immutable objects, but mobile structures that are constantly ‘at work’ and also offer the necessity as well as the possibility of being continuously redesigned: This work can be described as ‘infrastructuring.’ Susan Leigh Star and Geoffrey C. Bowker, “How to Infrastructure,” in *The Handbook of New Media*, eds. Leah Lievrouw and Sonia Livingstone (London: SAGE, 2002): 151–162, <https://doi.org/10.4135/9781446206904.n12>.

can be approached as media in their own right with various mediating functions. For example, they can also be understood as ‘infrastructural media’ insofar as they mediate the relation between platform technologies and cultural or social processes. Yet, research would have to further discern how this aspect of the hashtag’s mediating capacity qualifies as ‘infrastructural.’ The fact that we refer to hashtags in this open sense as infrastructures and media is due to our non-essentialist understanding of both concepts. The goal is not to answer what infrastructures and what media are, but when and under what conditions they become media/infrastructures³ and to what extent their observation as media and/or infrastructure can be productive for cultural studies research.

The ‘origin’ of the hashtag, as Johannes Paßmann shows, is part of a popular narrative of bottom-up-innovation: It is said to have originated on Twitter and not to have been implemented as a platform feature, but rather to have grown out of user practices.⁴ U.S. blogger Chris Messina is credited with the ‘invention’ of the hashtag when he suggested in a tweet in 2007 to use the hash character to group multiple tweets under one keyword. However, according to Paßmann, # was already used in older Internet Relay Chats (IRC) to form groups and has been translated and transformed into a new context on Twitter. Twitter has turned it into a clickable feature, which in turn made other tweets findable that use the same hashtag. The classification system spread quickly from Twitter to other platforms, what enables Paul Dawson to describe it as a “folksonomy, a bottom-up, user-generated system of classification.”⁵ Others have argued that the hashtag, standardized in the use of the hash character in combination with a word or phrase written without spaces, facilitates not only the sortability and searchability of content on websites, but also becomes a way of (meta)-commenting and an indicator of affiliation to communities or social movements.⁶ Zizi Papacharissi claimed that it can lead to a feeling of connectiveness in the sense of a social bonding in an ‘affective public.’⁷ Overall, the use of hashtags is not controlled or regulated by the platforms in the first place, but it makes platform

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- 3 Joseph Vogl, “Medien-Werden. Galileos Fernrohr,” *Archiv für Mediengeschichte*, no. 1 (2001): 115–123.
 - 4 Johannes Paßmann, “Mediengeschichte des Followers,” in *Following: Ein Kompendium zu Medien der Gefolgschaft und Prozessen des Folgens*, eds. Anne Ganzert, Philip Hauser, and Isabell Otto (Berlin: De Gruyter, 2023, in press).
 - 5 Paul Dawson, “Hashtag Narrative: Emergent Storytelling and Affective Publics in the Digital Age,” *International Journal of Cultural Studies* 23, no. 6 (2020): 968–983, 974, <https://doi.org/10.1177/1367877920921417>.
 - 6 Maik Fielitz and Daniel Staemmler, “Hashtags, Tweets, Protest? Varianten des digitalen Aktivismus,” *Forschungsjournal Soziale Bewegungen* 33, no. 2 (2020): 425–441, <https://doi.org/10.1515/fjsb-2020-0037>.
 - 7 Zizi Papacharissi, *Affective Publics: Sentiment, Technology, and Politics* (New York: Oxford University Press, 2015).

interaction accountable. Keywords for specific topics and events emerge from user practices, as do recommendations to limit the number of hashtags used to classify a post.⁸

As this brief history of hashtags and their theorization illustrates, the hashtag has emerged from a specifically situated and vaguely organized media practice into a general infrastructure for social media interaction.⁹ In the short time of the hashtag's infrastructuralization, it has formalized existing practices and, equally, spawned new practices. Hashtags exemplify that infrastructures do not only have to be large technical-material constellations, but that small signs can also have an infrastructural effect. In other words, the characteristic of **generativity** applies to hashtags, because they produce practices that would not exist without them or would not exist in this arrangement. On a most general level, hashtags have structured social media interaction by *organizing relations*. They provide a simple scheme of relating topics, accounts, and events. They enable an ongoing connecting and relatability in social media interaction. Hashtags are relations that enable relations. Even though the terms and phrases that attach themselves to the hash character can be fleeting and fast-moving, the relational structure itself remains stable and enduring.

The **relationality** of hashtag infrastructures is also reflected in the interaction of hashtags with other infrastructures in their environment. In this context, the question arises, which elements are part of the hashtag infrastructure, and which lie beyond it but affect the infrastructural operations and materiality and are affected by them. The silicon and transistors of the computers and the database operations of writing, storing, and retrieving the hashtag symbol do not only belong to the infrastructure of the hashtag but underlie its functioning. The same applies to the different representational forms that the hashtag may take, be it the octothorpe on the level of graphical user interfaces or its binary representation on the levels of computer instructions (1000011). The possibility and necessity of being represented in this way is not what defines the infrastructure of the hashtag, but it belongs to the infrastructure of standardized ASCII code. As has been claimed for infrastructures in general, the infrastructure of the hashtag is built upon existing infrastructures, and it might become the context in which new ones will be embedded. However, different from 'hard infrastructures' such as power plants and undersea cables, the

8 Ágnes Veszelszki, "#time, #truth, #tradition: An Image-Text Relationship on Instagram: Photo and Hashtag," in *In the Beginning Was the Image: The Omnipresence of Pictures: Time, Truth, Tradition*, eds. Benedek András and Ágnes Veszelszki (Frankfurt am Main: Peter Lang, 2016), 139–150; Michele Zappavigna, "Searchable Talk: The Linguistic Functions of Hashtags," *Social Semiotics* 25, no. 3 (2015): 274–291, <https://doi.org/10.1080/10350330.2014.996948>.

9 Cf. Christine Gerber, "Community Building on Crowdfunder Platforms: Autonomy and Control of Online Workers?" *Competition & Change* 25, no. 2 (2021): 190–211, <https://doi.org/10.1177/1024529420914472>.

hashtag's materiality appears to be more difficult to pin down. Here, the often scrutinized 'ideal type' of infrastructure—transportation and transmission infrastructure—might help as a first heuristic analogy. With infrastructures such as streets, cables and pipelines, hashtag infrastructure seems to share the function to organize movement. As a classification system the hashtag infrastructure allows its user to move through database records and to inscribe something into the database records and thereby increase its potential reach. In this analogy, the hashtag is an infrastructure of mobility, navigation, and reach. Moreover, the hashtag infrastructure builds clusters of linkages, or as Yarimar Bonilla and Jonathan Rosa call it in comparison to the classification system of a library: hashtags 'lasso' certain entries, making connections between accompanying texts.¹⁰ We get a glimpse of the materiality of this infrastructure where the reach and the clustering are not silently performed but debated, negotiated, and accounted for in practice. For example, social media users regularly comment about other users' deployment of hashtags or outspokenly criticize or even call to avoid specific ones.

This connects to the *practical* durability of hashtags, which stems from their integration into routinized behaviour. What hashtags accomplish is taken for granted in their use. As media of relational dynamics and the designation of relations, they are used as a matter of course and casually. Infrastructures and practices mutually sustain each other as latent structures. But on the spectrum of latent structures, they differ in their stability. Infrastructures are more conservative to change than practices, yet both of them are generative. With the increasingly familiarized use of hashtags, however, their meta-discursive function recedes in favour of the respective content or topic, and the medial function of networking is delegated to the background. One can even say that the emergence of a social meaning of hashtags (e.g., their use as a form of political expression or affiliation) is only possible when the media operations of networking fade into the background. Yet, this background function of networking remains essential part of the practical reality of the hashtag; in the same sense that the associated milieu of technical objects affect their individuation as Gilbert Simondon has described it.¹¹ For interrogating the infrastructural function of a 'technical ensemble'—to further use Simondon's terminology—with the hashtag at its centre and from the perspective of its practical realization, we

10 Yarimar Bonilla and Jonathan Rosa, "#ferguson: Digital Protest, Hashtag Ethnography, and the Racial Politics of Social Media in the United States," *American Ethnologist* 42, no. 1 (2015): 4–17, 6, <https://doi.org/10.1111/amet.12112>.

11 Gilbert Simondon, *Die Existenzweise technischer Objekte* (Zürich: diaphanes, 2012), 56–60. Simondon understands the individual and its milieu as an inseparable unit. A technical object (or a digital object like the hashtag) is thus not produced in a technical environment in the sense that it could exist detached from it at some point. Rather, the environment accompanies the ongoing ontogenesis of an object. Thus, a hashtag can never be understood as 'finished' or separable from its technical milieu.

must then follow how this background relationality is accounted for by its users and how it is materially manifested. The habitual use of a hashtag is thus never detached from the hardware and software operations that make that use possible in the first place.

The general interest for the operative locus of infrastructures as 'being in the background,' often emphasized by infrastructure theory,¹² bears an interesting resonance with the theorization of the surface in the media theories of writing and diagrams.¹³ The surface recedes and simultaneously enables and supports the inscription of graphical signs. By analogy, the materialization of the hashtag as a text token is premised on the surface of the screen. However, its background operationality goes beyond the surface of graphical user interfaces as indicated before. The writing of hashtags brings into being not only text but 'searchable' text,¹⁴ which requires database operations of machinic writing and retrieval, and the possibility for users to access and perform search. This has two consequences: First, the background operationality of the hashtag as infrastructure and of the practices that revolve around it must thus be thought of as thoroughly sociotechnical. Secondly, the practice of searching is one of the key ways in which the background operationality of the hashtag infrastructure is accounted for.

Put differently, **regularity** or **routine** as a central characteristic of infrastructures can be found in the case of hashtags both on the level of platform features and on the level of user practices. Hashtags are only effective if they are repeated and used over a longer period. Moreover, because of their ability to be machine-readable and searchable, hashtags also enable and stabilize the algorithmic capture of social media interaction on the platform for subsequent analytical purposes. They can be easily integrated into recommendation engines and exploited to visualize trends. Hashtags are thus also important anchors of social media research. However, the prominence of the hashtag in attempts to analyse 'public discourse,' be it academic or commercial, also has its obvious shortcomings. On the one hand, the reliance on hashtags tends to be reductive, painting discursive dynamics as "chaotic" that await ordering through the hashtag, and overshadowing the structuration of discourse on other cultural levels.¹⁵ On the other hand, the orientation at a limited set of popular hashtags comes at the price of invisibilizing other thematic anchors or sidelining

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- 12 Susan Leigh Star and Karen Ruhleder, "Steps Toward an Ecology of Infrastructure: Design and Access for Large Information Spaces," *Information Systems Research* 7, no. 1 (1996): 111–134, 112, <https://doi.org/10.1287/isre.7.1.111>.
 - 13 Sybille Krämer, *Figuration, Anschauung, Erkenntnis. Grundlinien einer Diagrammatologie* (Berlin: Suhrkamp, 1996), 65–70.
 - 14 Zappavigna, "Searchable Talk: The Linguistic Functions of Hashtags."
 - 15 Tommaso Venturini, Liliana Bounegru, Jonathan Gray and Richard Rogers, "A Reality Check(list) for Digital Methods," *New Media & Society* 20, no. 11 (2018): 4195–4217, 4210, <https://doi.org/10.1177/1461444818769236>.

perspectives on the issues not represented in the posts around the respective hashtags. The ranking and competition of hashtags has been further stabilized by the design of social media platforms, which prominently display popular hashtags as trend markers or entry points for exploration or provide automatized recommendations which hashtags to use for a post. On the level of user strategies, this has led to organized attempts to get certain hashtags into the trends, to strategically combine different hashtags in order to alter the “framing” or “hijack” hashtags that are currently trending.¹⁶ Besides search, discursive observation is a second key practice that ‘sits on top’ of the infrastructure of hashtags.

Hashtags are particularly relevant from a cultural perspective because they organize more than just internal platform interactions: they can give rise to specific metadata tagging that generate overarching discourses, debates, narratives, and movements. We would like to briefly illustrate this narrative generativity of hashtags using the example of #metoo. The case of #metoo is particularly interesting from a cultural perspective because a latent narrativity is already inscribed in every single post tagged with the hashtag through the phrase ‘me too,’ which calls for the sharing of personal stories and thus connects to the technological affordances of hash relationality. Dawson has called this “emergent storytelling.”¹⁷ First formulated in 2017, the call ‘metoo’ elicited a widespread response in the form of personal stories about sexual abuse, which, tied to the hashtag, created an extensive phenomenon that could in turn be expressed in a large amount of data via the countability of tagged posts, and then in a next step could be narrativized as a social phenomenon based on the multitude of individual posts. Storytelling took place at the micro-level of user practices and platform technicity as much as it did at the macro-level of cultural narratives enabled via the indexicality of the hashtag.¹⁸

The case of #metoo and other hashtags that started social movements in the recent years point to a social generativity of hashtags and the necessity of their maintenance. Hashtags facilitate discursive coordination and provide a symbolic address for practices of attachment and identification. They publicly coordinate a loose assembly of speakers that over time becomes recognizable as a collective project, transforming the act of hashtagging into one of possible affiliation or identification.¹⁹ This socio-generative function of hashtags is premised on some degree of semantic

16 Moa Eriksson Krutrök and Simon Lindgren, “Continued Contexts of Terror: Analyzing Temporal Patterns of Hashtag Co-Occurrence as Discursive Articulations,” *Social Media + Society* 4, no. 4 (2018): 1–11, <https://doi.org/10.1177/2056305118813649>; Venturini et al., “A Reality Check (list) for Digital Methods.”

17 Dawson, “Hashtag Narrative.”

18 Dawson, “Hashtag Narrative.”

19 Michele Zappavigna, “Ambient Affiliation: A Linguistic Perspective on Twitter,” *New Media & Society* 13, no. 5 (2011): 788–806, <https://doi.org/10.1177/1461444810385097>; Summer Harlow and Anna Benbrook, “How #blacklivesmatter: Exploring the Role of Hip-Hop Celebrities in

plasticity of the hashtag, where the meaning of a hashtag is only stabilized over time and in whose course positions can be differentiated and claimed. Moreover, it is in the larger cultural narratives that the use of the hashtag becomes meta-reflexive, for it is precisely the mass use of #metoo on Twitter and Instagram that becomes the subject of (net)feminist narratives about the meaning of the social movement. Different formations within the spectrum of (post-/pop-/neoliberal-/anti-) feminist activism could emerge from the relationalizations that the hashtag or its counter concepts (like #notallmen or #mentoo) enabled. This clearly shows that hashtags as infrastructures also depend on **propellants** and **maintenance**. In our example, 'propellants' refer to the need to keep publishing new posts and images with the hashtag and thus keep the interactions going. 'Maintenance' in turn refers to ensuring the technical functioning, but also to the critical analysis and reflection of hashtag use at the level of practices, allowing for course corrections and adjustments of interaction dynamics if necessary. Only if hashtags are maintained and transformed in a constant "infrastructure work"²⁰ can they unfold their cultural dynamics. Conversely and especially in the manifold commercial uses of #metoo, this also raises the question of whether hashtags can wear out.²¹

To take stock: we have touched upon a wide panorama of different activities that have revolved around hashtags. This raises the question about the relationship between the universality of these activities and their particular role in the technical ensemble that defines hashtag infrastructures. Two perspectives might be followed to describe this relationship: Firstly, observed activities may be grouped into mid-range categories in order to identify 'fields' of pragmatic continuity and innovation shaped through the generative and organizing work of hashtags. From this perspective it appears that hashtags continued and transformed epistemic practices (classifying, sorting, searching), membership practices (affiliating, identifying), communicational practices (commenting, recommending, calling to connect), practices of publication (increasing reach) as well as observational practices (visualizing, counting, narrativizing). In their capacity to provide the infrastructural background for these practices to be performed, hashtags mediate long-established cultural techniques but also transform and reconfigure their relation. Most notably this can be seen in the intertwining of counting and narrativizing for collective self-observation. Secondly, we can move to a more abstract level of categorization and attempt

Constructing Racial Identity on Black Twitter," *Information, Communication & Society* 22, no. 3 (2019): 352–368, <https://doi.org/10.1080/1369118X.2017.1386705>.

20 Gabriele Schabacher, *Infrastruktur-Arbeit. Kulturtechniken und Zeitlichkeit der Erhaltung* (Berlin: Kadmos, 2022).

21 Tanisha Afnan, Hsiao-Ying Huang, Maria Sciafani, and Masooda Bashir, "Putting a Price on Social Movements: A Case Study of #metoo on Instagram," *Proceedings of the Association for Information Science and Technology* 56, no. 1 (2019): 1–9, <https://doi.org/10.1002/praz.2>.

to identify activities that are particularly typical for infrastructures. For example, in their research on infrastructures of making public, Matthias Korn and his co-authors have proposed a heuristic of three basic activities to follow when studying infrastructures,²² picking up a heuristic originally developed by Sebastian Gießmann for the study of ‘media practices’²³: activities of registration/identification, of delegation and of coordination. It must be added that these are metapragmatic categories for a very abstract level of description and largely inspired by work in Actor Network Theory and Science and Technology Studies. Despite this level of abstraction, especially the two metapragmatic categories of registration and coordination are useful reference points for a study of hashtags. While coordination has already been described above in the context of social movements, registration/identification translates into the provision of machine-readability and algorithmic capturing on the one hand, and into the registration of a relational structure as a meaningful token for potentially intensive affective attachment on the other hand.

With these different layers and scopes of practice in mind, we can now return to the tentative question from the beginning about the possibility of understanding hashtags as ‘infrastructural media’ that mediate between platform technologies and user practices. Rather than generalizing or essentializing this functional relationship, we would emphasize that it needs particular practice contexts, in which the hashtag can obtain the status of an infrastructural medium. For example, hashtags may obtain the status of an infrastructural medium for the above-mentioned relation between user and platform in the context of search operations, which are both relevant for user practices and the algorithmic operations of the platform; or they do so in the context of classification processes that are valuable to the economic procedures of the platform owners and the affiliation practices of users. In other words, whether we can attribute to hashtags the function of an ‘infrastructural medium’ depends on their role and recognition in particular practice networks.

In summary, hashtags function as infrastructures because they stabilize and organize existing practices and because they set social and cultural processes in motion. The study of hashtags clearly emphasizes the relevance of a cultural perspective on infrastructures for interaction in the following four points: First, infrastructures and practices are recursively interrelated. Infrastructures can emerge as stabilizations or materializers from practices and in turn give rise to new practices. Second: Infrastructures enable and process socio-technical relations. They can link technical connectivity with affective ties and combine matters of organization with those

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- 22 Matthias Korn, Wolfgang Reißmann, Tobias Röhl, and David Sittler, “Infrastructuring Publics: A Research Perspective,” in *Infrastructuring Publics*, eds. Matthias Korn, Wolfgang Reißmann, Tobias Röhl, and David Sittler (Wiesbaden: Springer VS, 2019), 11–47.
- 23 Sebastian Gießmann, “Elemente einer Praxistheorie der Medien,” *Zeitschrift für Medienwissenschaft* 10, no. 2 (2018): 95–109, <https://doi.org/10.25969/mediarep/1228>.

of identification. Third, infrastructures can encompass different levels and scales of narrativization and discourse. They thus mediate between the level of micro-practices and the macro-level of cultural formation. Finally, these infrastructures are performative; they can 'produce' discourses, narratives, and social movements.

