

Wenhao Bi

ASSEMBLING VIA ‘DANMU’: THE PLAYFUL NETWORKS OF BILIBILI

Abstract

The ‘danmu’ system in the Chinese video-sharing social media platform Bilibili, in allowing comments to sync to any specific playback time, has constructed a community where separated viewers can join in the seemingly simultaneous conversations at the same time they watch videos. The participatory design of such co-presence demonstrates the political and cultural gesture of speaking out and exchanging ideas as the main orientation of the platform. Through danmu comments are the living networks connected both in the videos they are attached to, and in Bilibili as a whole. Despite the instantaneous emotions displayed in individual danmu comments, there are affective connections that shape the temporal quality of participation. The playfulness embedded in the interface design has further directed the gratification of speaking out on the platform.

APRJA Volume 9, Issue 1, 2020
ISSN 2245-7755

CC license: ‘Attribution-NonCommercial-ShareAlike’.

The danmu commentary function was competitively trialled in different media architectures such as cinema and mainstream video platforms in China in 2014 due to its commercial value (Chen et al., “Understanding Gratifications” 153–54; Wan et al. 1; Cao). With the literal meaning of ‘bullet curtain’, danmu allows numerous comments to fly over the video from the right to the left as it plays. Currently, the danmu function is best performed on the Chinese video-sharing social media platform Bilibili among its millions of monthly active users. In other words, connectivity is established both through videos and danmu comments. What then are the cultural and political concerns and potentials around such a socio-technical setting?

Unpacking danmu in Bilibili

The essence of the danmu function is attaching text to a specific playback time in the video. Unlike the general impressions and post hoc reflections in the bottom half of a webpage, detailed and specific information can be conveyed on the video screen through this function (Chen et al., “Watching a Movie Alone yet Together” 732). Hence it is generally used by users for feedback on or as annotations to the video, be it their instantaneous emotions and feelings (Chen et al., “Watching a Movie Alone yet Together” 732), for amateur subtitles (Yang), for the sharing of explicit knowledge such as the background music (Wu et al. 20), or for the addition of their own phrases, codes and symbols (Wan et al. 15).

Bilibili’s origin as a part of the otaku ecosystem fostered around anime, comic, game and novel (ACGN) is culturally connected to the danmu function (Zheng). The richness in cataloguing, storing and

displaying vocabulary, music and other cultural elements in the ACGN community grounds the accumulation and circulation through danmu, echoing Azuma’s understanding of the “postmodern database model” (Azuma 31–32; Chen; Chen et al., “Understanding Gratifications”; Zheng). It has also grounded the gatekeeping of posting danmu comments which requires users to have passed the membership test with 100 questions “covering ACGN knowledge, etiquette regulations and good practice on Bilibili” (Chen, pt. Exclusivity strategies). In other words, the abundance of niceness-oriented danmu comments is culturally and technically embedded in the ‘purity’ of the Bilibili community. After its transformation into an incubator for the wider youth culture (Xu 443), Bilibili has extended its coverage to a variety of popular culture genres such as films, TV series and documentaries (Chen), yet the shared preferences around danmu comments have continued on the platform.

Unlike the membership restriction in posting danmu comments, viewing videos and danmu comments is unlimited. The flying comments are taken as a secondary but unique layer that reminds viewers of the existence of others despite the physical separation (Wan et al. 4). While the feeling of ‘alone yet together’ can be elaborated from a textual perspective that emphasises the gratification of meeting the utilitarian needs such as learning, hedonic needs such as relaxation, and social needs such as avoiding loneliness and keeping up with the peers (Chen et al., “Watching a Movie Alone yet Together” 733), the juxtaposition of the video and the comments also gestures towards a conflation of the visual experience since the two components are taken as a whole in multitasking scenarios such as subtitles for cross-language videos (Yang 271). Danmu comments in this light not only mediate the knowledge and information related

to the video, but also deliver a 'stream of consciousness' shaped by the embodiment in visual perception (Liu et al. 284; Johnson 308). In other words, the viewing experience with danmu comments comes from both the separation and collision between video and its comments (Li 244).

Considering Bilibili's marketing strategy, there seems to be an inconsistency or ambiguity with viewers attracted to engage with the danmu function on the one hand and the overlapping comments obstructing a full comprehension of video content on the other (Wan et al. 2). However, the communicative interactivity is highlighted within the 'curtain' interface that "operates against a transparent access to media content" and lies between visibility and invisibility (Li 237), and is facilitated by the layout of Bilibili's video page and its default settings. Similar to the platform-as-delivery vein that emphasises visual transparency with "full-screen aesthetics" (Steinberg 185, 191), Bilibili weighs its video contents over other textual information by placing the video player as the key element in the browser window. It holds around 40% above the scroll before switching to the full screen mode with a toolbar for danmu control and a text field for posting comments. Contrary to the dominance of video-related contents is the marginalised textual information outside the video player. Only the first 3.5 lines of the video description is shown below the video player with the remaining to be unfolded with a button. Similarly, a three-column list that stores the times each danmu comment is sent, the commentary texts and the playback times they synched to is folded by default to the right of the video player. In short, the video player is the designated 'field' where interactivities take place.

Posting danmu comments can be simplified as interactions upon a canvas where the video image is projected (Johnson 303), yet the cultural and technical boundaries

have discouraged certain practices. The membership test, for example, has filtered out bots and suppressed the trolling potential due to its knowledge threshold of the community's culture and etiquette. Another example is the five-second display time of each danmu comment that shapes the tendency of posting the immediate feelings and reactions rather than structuring them into long sentences (Zheng). These settings have guided the transgressive momentum so that members are socially connected and creatively engaged to enjoy and challenge the culture interpretatively and expressively (Zhang 2, 5). A sense of belonging to a community is also formed under the shared standard in posting danmu comments.

The storage capacity for 'real-time' danmu comments in one video is based on the video length. For example, 100 comments are allowed to be shown on the screen for a video that is no longer than 30 seconds, and instead of blocking the comment entry, the oldest comment will be stored in the server as an 'invisible' record to give its way to the latest one when the limit is reached. While such a design can be culturally and politically interpreted in terms of openness and equality since the comments are not judged with 'likes' or 'dislikes', the openness and equality cannot last long as the first-in-first-out regulation indiscriminately removes the earliest comment. Hence danmu comments can be seen as an adapted version of graffiti with playfulness since different layers pile up ephemerally.

The anonymity of graffiti is also shared in the danmu comments with the aesthetic and communicative preference of prioritising texts and precluding authorship (Chen et al., "Watching a Movie Alone yet Together" 732). It has therefore shaped an immersive experience of encountering comments from nowhere by somebody in a vague past. This is where Hamano Satoshi coined the

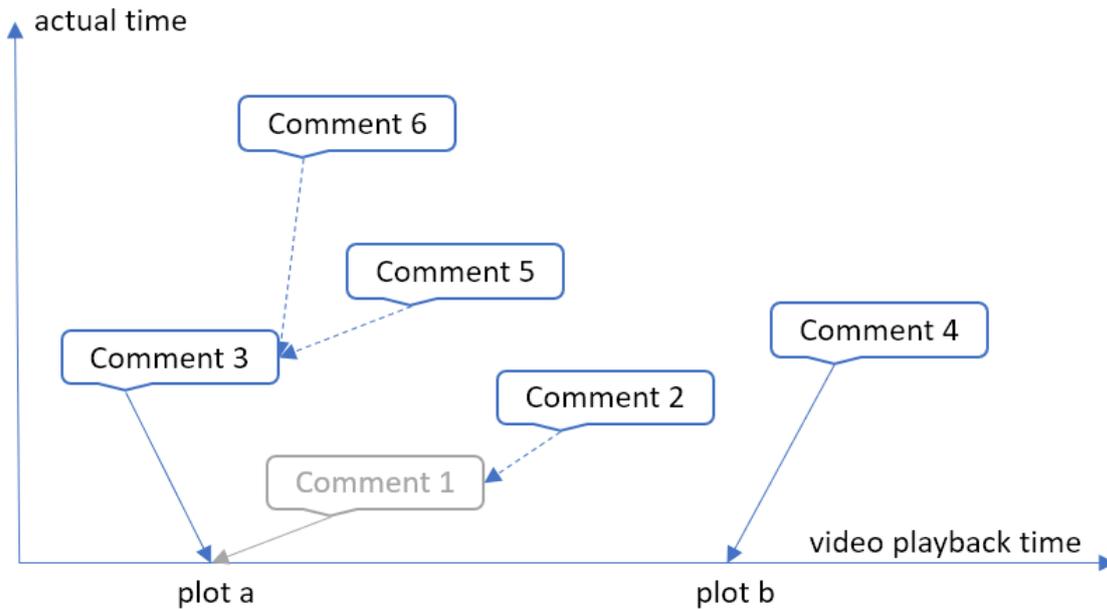


Figure 2: Connectivity of danmu.

It has also formed the connectivity among viewers that affords replies, resonances and denials to earlier comments. From the network perspective, each danmu comment can be taken as a node and the interactions as the edges, whereas the plots of the video hold the base of the network. The ubiquity of connectedness is emphasised in such an abstracting and spatialising procedure with its technical roots in Eulerian graph theory (Thacker, “Part One”). In a sample of the relationships around danmu comments as sketched in Figure 2, comments 1 and 3 indicate the feedback regarding plot a, whereas comment 5 and 6 based on comment 3 can be loosely linked with each other since the focus of the two has shifted from the video to one previous comment. In short, the connectivity of danmu comments are twofold.

More specifically, the connectivity among viewers is clearly demonstrated in the pseudo-synchronicity where ‘monologue discussions’ are situated, given the feeling of temporal disjunction on Bilibili (Li 249). Although the pseudo-liveness has intensified and highlighted the contradictory temporality (Li 249), it has captured the eagerness of

speaking out within the context of the specific content as a precondition. As a result, danmu comments have shaped the sense of a talkative crowd with echoing sentiments or discordant thoughts (Cao). The composite of previous experiences of others’ viewing reactions in the present moment indicates the connectedness among the different layers of danmu comments (Johnson 301).

The loose control from the community has also facilitated the connectivity among the viewers. According to the design in Bilibili, danmu comments cannot be deleted either by the commenter or by the video uploader, but can merely be switched to ‘invisible’ on screen. Such a design choice can therefore be interpreted as a gesture of accepting different opinions. However, when it comes to the comments that go against the community regulations, the only legitimate means is to mark them with the ‘report’ function and leave them to the back-end administrators. In this light, denouncing transgressive danmu comments has de facto enhanced the connections among comments.

However, as Thacker (“Part One”) noted, since time has been flattened into

space in a topology or map of a network, the inherent dynamics and changes within the composition of individual nodes and in the relations between nodes are not represented. The danmu capacity that keeps comments updated but also ephemeral, for example, has structured the temporal dynamic that 'washes away' older comments. When comment 1 in grey is ejected as the danmu capacity is reached, not only is the node itself removed, but comment 2 that is based on comment 1 gets isolated as well. In other words, neither nodes nor edges are stable when the temporal dimension is included in the network since networks are always living networks (Thacker, "Part One").

While the connectivity in danmu is rather obvious in individual videos, it is in fact shared throughout the platform regardless of the contents of the videos or the comments. Not only do danmu comments afford the diversions and transgressions from the original narratives of the videos, posting them is also less demanding in time and effort and more passion or emotion-driven compared to making and uploading a video. Codes and slang in danmu comments get circulated easily due to their communicative value and the anonymity that stresses the textual contents. In this light, it is the danmu function that dominates Bilibili whereas the video contents are dethroned as the bases for the creativity and playfulness in comments. In fact, the amateurism for video makers Bilibili follows has boosted the danmu comments as a channel for judgements and feedback from others. Moreover, the unique multitasking interface that demands time to habituate has limited the expansion of the user community despite its participatory appearance. The scrolling comments are communicated by playfully revisiting, repeating and replaying given their ephemeral nature (Li 251). Viewing from a platform-wise perspective, a network of danmu comments that channels

and articulates the participatory attitudes can be portrayed as a cultural generator despite the different videos these comments are embedded in.

Critically, the interiority in the gatherings of danmu is questioned under the notion of 'swarm' that originates from nineteenth century natural science; classification in zoology, structure in comparative anatomy and context in the study of ecosystems (Thacker, "Part Two"). The ethological study of 'social insects' is highlighted in this theoretical trajectory as it raises the issue of the structuring process from 'dumb' individuals to 'intelligent' collectives, particularly with their distributed interactions and decisions rather than the central controller (Thacker, "Part Two"). Such a dumb/intelligent duality can be referenced in the Bilibili case as the fundamental presumptions of the mental and behavioural differences between individuals and collectives, and can also be observed in danmu comments. While the message each danmu comment conveys varies, the general impression of danmu is a communicative means with friendliness and openness fostered by Bilibili's community building. In other words, there remains a middle region between the individual and the collective.

One key approach to these questions is re-examining the idea of participation in Bilibili. Two layers of participation are afforded when danmu comments are posted to videos. On the one hand, it is the interactive design that encourages the users to express themselves as "a rhetoric of progress which promised social progress through technological advancement" (Schäfer 11). From a rather cynical perspective, danmu comments that seem to facilitate a process of emancipation are in fact "integrated into new business models and are subsequently subject to corporate control" (Schäfer 14). On the other hand, the cultural impacts on individual and collective decisions cannot

be neglected (Jenkins et al. 12) since they are able to affect or transform the structural obstacles among different levels (Keltly 24). This is where the emphasis on the participatory condition that refers to both the structure of interpellation and the materiality it relies upon is situated. Following Louis Althusser's reading of ideological interpellation, the participatory condition grounds how subjects respond and what they become (Barney et al., ix-x). In this light, danmu comments in general have on the one hand established the living networks with one link back to the cultural products, and have channelled Bilibili's cultural orientation and social value with other regulatory settings on the other. This is also where collective creative energy within networks emerges.

Representing the affects

Despite the membership test that filters out bots, the correspondence between one danmu comment and a user cannot be established since one person can hold multiple accounts and each of them can be used to send multiple comments. Yet the gathering of danmu has shaped a sense of belongingness and togetherness as if the comments represent digital personas if not people. A theoretical consideration of crowds and affect can be examined in this context.

While the idea of 'crowd' is often traced back to Gustave Le Bon who saw a hazardous status of irrationality with the dense assembling of bodies regardless of the social classes the individual crowd member belonged to (Borch 41), Gabriel Tarde's approach is also noteworthy. From his perspective, crowds are subjected to the dynamics of imitation and suggestion which the society is also situated in (Borch 48). Hence, people act according to a semiconscious imitation

which lies between rational choice and irrational desire, and their minds work as part of an endless social network (Borch 58). It is therefore difficult to take a clear cut between the individual and society as well as between internal feelings and external restraints (Borch 58). Despite the different perspectives and hypotheses, both Le Bon and Tarde have taken rationality as an ultimate virtue people failed to achieve due to the physical co-existence.

Elias Canetti's study that focuses on the discharge as the key element in crowd formation shed lights upon a shift from physically congregating to participating in the agendas of mass media (Hagen 128). Crowd members are freed from hierarchies and the fear of being touched in the goal of gathering (Canetti 15-18), and the destructiveness in attacking boundaries such as windows, gestures a sense of togetherness and belongingness within the crowd transcending the limits of its individual members (Canetti 19-20). Features of a crowd such as density, equality, togetherness and belongingness, or at least a sense of them, have continued in the contemporary digital conditions (Chen et al., "Understanding Gratifications").

Like crowds, affect is also seen as an unstable and hazardous factor in an ordered and rational society, especially given the bodily interactions in the assemblages of affective drives (Papacharissi 14). The psychological equivalent to feeling or emotion is connected to the cognitive and the conative that respond to the detection of personal significance (Neuman et al. 9; Papacharissi 12), and is therefore regarded as a synonym for irrationality that endangers both the judgements in making rational decisions and democracy as a form of governance (Marcus et al.; Papacharissi 10). Recent research, on the other hand, has marked an affective turn in the analysis of politics and everyday life which contest the perspective of rationality

(Papacharissi 12). Despite various understandings and interpretations, affect can hold both the corporeal intensity and the abstract fluidity in its focus at the same time, and is inseparable from the flows of technologies (Papacharissi 15–16). In networked patterns, more specifically, affect offers a perspective with an emphasis on power distributions and political formations based on non-linear substantial relationships (Papacharissi 17). It is therefore argued that the significance on the impact or rationality in digital political activities are frequently misunderstood or overlooked as the contemporary political environments cannot be separated from “affective statements that mix fact with opinion, and with emotion” (Papacharissi 26–27). To follow the affective intelligence theory that attentively examines various stimuli to the affective state, the affective reactions and behaviours can be brought back to enthusiasm and aversion on the one hand and anxiety on the other (Marcus et al.; Neuman et al. 3, 16).

Although the assemblage of danmu comments is not equivalent to the physical gathering of a crowd, the momentum of collective reactions emerges. Apart from marking the presence of users, danmu comments mock the contents with slang or gags, or debate viewpoints in the video and previous comments. Despite the various opinions and attitudes, they reveal political moments where antagonist engagements take place and where a sense of belonging and togetherness is shaped. Moreover, the temporal dimension in danmu that keeps comments ephemeral has persevered the temporal quality of participation. Like graffiti to urban governance, danmu has challenged the fundamental ideas of power relationships in Bilibili. Yet the empowerment in danmu comments can also lead to a narcissistic tendency that focuses on expressing instantaneous emotions instead of taking in and reflecting on other comments. In this

regard, danmu function has accumulated the affective factors in watching videos with the willingness to speak out, and has further cultivated a collective and playful persona that expresses itself more than listens.

Playing with danmu

The danmu interface can be linked to a broader discussion of playfulness that regards both the rigidity of media structures and the singularity of interpreting media texts as having since room for modification to meet personal needs and as such unleashes creativity in cultural participation (Raessens 106, 108). This is situated in a process that transforms media studies into a playground with ludic activities and experiences due to the socio-cultural, media and institutional changes at the end of the last century (Fuchs 129, 135; Raessens 97). One of the key concerns in this transformation is the materiality of digital media based on hypermediacy in the interactions with multimedia interfaces despite the transparent immediacy it is supposed to follow (Bolter and Grusin 5; Frissen et al. 24–25). To put it differently, the omnipresence of the interfaces through which users experience and interact with computing has become less transparent despite the early aesthetical pursuit for seamless interactions (Andersen and Pold 22), raising a question of playfulness in these interfaces or buttons closely connected to the social and communicative affordances. All these changes have followed the broader ludic turn “in which games and playful experiences are understood as essential components of society and culture” (Fuchs et al. 7–8, 12). Playful elements are integrated in products and services with a cultural-economic concern and as a lifelong attitude so that user involvement can be advanced (Raessens

95–96). The turn takes place not only in the realm of leisure, but educational, political and even military domains which were once considered the opposite of play as well (Raessens 94).

Deep down in this ludic turn is the fundamental understanding of play as part of human nature. At the centre of play is the seriousness in recognising and respecting the rules that constitute game worlds (Bateson 30; Huizinga 11; Raessens 98). Such a temporal and spatial boundary, also known as 'the magic circle', has grounded a free activity of pretence that attracts the player from ordinary life without material interest or profit (Huizinga 13). The messages or signals in play are not necessarily true or real, and these signals can stand for something does not actually exist (Bateson 141).

In this light, the playfulness of the danmu interface has taken the lead in Bilibili. The connectivity in danmu is facilitated by the playful design that devalues videos and enhances the communicative interactions of rewinding, pausing and posting. Challenges over the original narratives such as disagreements and satire can also be placed in this playful trajectory. Having said that, seriousness still exists in Bilibili in the case of feedback and discussions in danmu. When it comes to the boundaries of the magic circle that distinguish playful activities from ordinary life, Bilibili's regulatory settings have functioned as the divisions. In other words, the understandings of 'transgressions' and 'norms' within the Bilibili community differ from 'the outside'.

The pretence in play is also noteworthy with its ambiguous threshold between reality and unreality as a paradoxical sum of two negative meanings at a metacommunication level. To put it more simply, action inside the magic circle "both is and is not what it appears to be" (Bateson 139; Sutton-Smith 1). Therefore, playful behaviours can be seen as

an illusion mirrored from the real world that represents reality but in another form (Fink 27–28). In this light, the world of play is built intra-world both with its own kind of reality and as part of everyday reality (Axelos 9), and its boundaries are perceivable as "we know when we are playing and when we are not" (Frissen et al. 18, 24–25). Such an ambiguity has further challenged the hypothesised dichotomy between seriousness and playfulness (Frissen et al. 9; Raessens 94). This is also why both ill-mannered danmu comments and serious advice can be translated into and accepted as casual jokes. In a broader sense, the playfulness in danmu has enhanced the connectivity and redirected the emotional attitudes comments contribute to the gratification of speaking out but not necessarily being heard.

Concluding remarks

The technical design of danmu has encouraged users' involvement when they watch separately, and has formed a sense of togetherness with the overlapping comments. Both Bilibili's marketing strategies and the affordance of danmu have made the platform more than a mere ACGN fandom community, and have highlighted the playfulness in danmu bounded by the community's regulations. The connectivity of danmu has grounded the cultural and political concerns and potentials with the collective creative and affective energies.

Although the discussion is based on a Chinese video-sharing service, most of the observations can be applied to other social media platforms as commenting and reposting as a participatory means of engagement has been widely introduced. Playfulness both in the interface design and in users' reactions has also gone beyond Bilibili with other

examples such as the ephemeral Instagram Stories. In other words, playful networks can be found in different forms and in multiple platforms, and serve to question the understanding of and expectations of participation built into these platforms.

Works cited

Althusser, Louis. *On the Reproduction of Capitalism: Ideology and Ideological State Apparatuses*. Verso, 2014.

Andersen, Christian Ulrik, and Søren Pold. "Interface Criticism: Why a Theory of the Interface?" *The Metainterface: The Art of Platforms, Cities, and Clouds*, 2018, pp. 15–38. Open WorldCat, <http://mitpress.mit.edu/9780262037945>.

Axelos, Kostas. "Planetary Interlude." *Game, Play, Literature*, edited by Jacques Ehrmann, Beacon Press, 1971, pp. 6–18.

Azuma, Hiroki. *Otaku: Japan's Database Animals*. English ed., University of Minnesota Press, 2009.

Barney, Darin, et al. "The Participatory Condition: An Introduction." *The Participatory Condition in the Digital Age*, edited by Darin Barney et al., University of Minnesota Press, 2016, pp. vii–xxxix.

Bateson, Gregory. *Steps to an Ecology of Mind: Collected Essays in Anthropology, Psychiatry, Evolution, and Epistemology*. Aronson, 1987.

Bolter, Jay David, and Richard Grusin. *Remediation: Understanding New Media*. MIT Press, 2000.

Borch, Christian. *The Politics of Crowds: An Alternative History of Sociology*. Cambridge University Press, 2012. DOI.org (Crossref), doi:10.1017/CBO9780511842160.

Canetti, Elias. *Crowds and Power*. Continuum, 1981.

Cao, Xuenan. "Bullet Screens (Danmu): Texting, Online Streaming, and the Spectacle of Social Inequality on Chinese Social Networks." *Theory, Culture & Society*, Oct. 2019, p. 026327641987767. DOI.org (Crossref), doi:10.1177/0263276419877675.

Chen, Yue, et al. "Understanding Gratifications of Watching Danmaku Videos – Videos with Overlaid Comments." *Cross-Cultural Design Methods, Practice and Impact*, edited by P.L.Patrick Rau, vol. 9180, Springer International Publishing, 2015, pp. 153–63. DOI.org (Crossref), doi:10.1007/978-3-319-20907-4_14.

_____. "Watching a Movie Alone yet Together: Understanding Reasons for Watching Danmaku Videos." *International Journal of Human–Computer Interaction*, vol. 33, no. 9, Sept. 2017, pp. 731–43. DOI.org (Crossref), doi:10.1080/10447318.2017.1282187.

Chen, Zhen Troy. "Poetic Prosumption of Animation, Comic, Game and Novel in a Post-Socialist China: A Case of a Popular Video-Sharing Social Media Bilibili as Heterotopia." *Journal of Consumer Culture*, July 2018, p. 146954051878757. DOI.org (Crossref), doi:10.1177/1469540518787574.

Fink, Eugene. "The Oasis of Happiness: Toward an Ontology of Play." *Game, Play, Literature*, edited by Jacques Ehrmann, translated by Ute Saine and Thomas Saine, Beacon Press, 1971, pp. 19–30.

Frissen, Valerie, et al. "Homo Ludens 2.0: Play, Media, and Identity." *Playful Identities: The Ludification of Digital Media Cultures*, edited by Valerie Frissen et al., Amsterdam University Press, 2015, pp. 9–50.

Fuchs, Mathias, et al., editors. "Introduction." *Rethinking Gamification*, Meson Press, 2014, pp. 7–17.

_____. "Predigital Precursors of Gamification." *Rethinking Gamification*, edited by Mathias Fuchs et al., Meson-Press, 2014, pp. 119–40.

Hagen, Wolfgang. "Discharged Crowds: On the Crisis of a Concept." *Social Media - New Masses*, edited by Inge Baxmann et al., 1st edition, Diaphanes, 2016, pp. 123–33.

Huizinga, Johan H. *Homo Ludens: Study of the Play Element in Culture*. Routledge & Kegan Paul, 1980.

Jenkins, Henry, et al. *Participatory Culture in a Networked Era: A Conversation on Youth, Learning, Commerce, and Politics*. Polity Press, 2016.

Johnson, Daniel. "Polyphonic/Pseudo-Synchronic: Animated Writing in the Comment Feed of Nicovideo." *Japanese Studies*, vol. 33, no. 3, Dec. 2013, pp. 297–313. DOI.org (Crossref), doi:10.1080/10371397.2013.859982.

Kelty, Christopher M. "From Participation to Power." *The Participatory Cultures Handbook*, edited by Aaron Alan Delwiche and Jennifer Jacobs Henderson, Routledge, 2013, pp. 22–31.

Le Bon, Gustave. *The Crowd: A Study of the Popular Mind*. Dover Publications, 2001.

Li, Jinying. "The Interface Affect of a Contact Zone: Danmaku on Video-Streaming Platforms." *Asiascope: Digital Asia*, vol. 4, no. 3, Sept. 2017, pp. 233–56. DOI.org (Crossref), doi:10.1163/22142312-12340079.

Liu, Lili, et al. "Watching Online Videos Interactively: The Impact of Media Capabilities in Chinese Danmaku Video Sites." *Chinese Journal of Communication*, vol. 9, no. 3, July 2016, pp. 283–303. DOI.org (Crossref), doi:10.1080/17544750.2016.1202853.

Marcus, George E., et al. *Affective Intelligence and Political Judgment*. University of Chicago Press, 2000.

Neuman, W. Russell, et al. "Theorizing Affect's Effects." *The Affect Effect: Dynamics of Emotion in Political Thinking and Behavior*, edited by George E. Marcus et al., University of Chicago Press, 2007, pp. 1–20. DOI.org (Crossref), doi:10.7208/chicago/9780226574431.001.0001.

Papacharissi, Zizi. *Affective Publics: Sentiment, Technology, and Politics*. Oxford University Press, 2014.

Raessens, Joost. "The Ludification of Culture." *Rethinking Gamification*, edited by Mathias Fuchs et al., Meson Press, 2014, pp. 91–114.

Schäfer, Mirko Tobias. *Bastard Culture! How User Participation Transforms Cultural Production*. Amsterdam University Press, 2011.

Steinberg, Marc. *The Platform Economy: How Japan Transformed the Consumer Internet*. University of Minnesota Press, 2019.

Sutton-Smith, Brian. *The Ambiguity of Play*. Harvard University Press, 2001.

Tarde, Gabriel. *The Laws of Imitation*. Translated by Elsie Clews Parsons, Henry Holt And Company, 1903.

Thacker, Eugene. "Networks, Swarms, Multitudes (Part One)." *CTheory*, edited by Arthur Kroker and Marilouise Kroker, May 2004, <http://www.ctheory.net/articles.aspx?id=422>.

_____. "Networks, Swarms, Multitudes (Part Two)." *CTheory*, edited by Arthur Kroker and Marilouise Kroker, May 2004, <http://www.ctheory.net/articles.aspx?id=423>.

Wan, Anan, et al. "Online Social Viewing: Cross-Cultural Adoption and Uses of Bullet-Screen Videos." *Journal of International and Intercultural Communication*, May 2019, pp. 1–19. DOI.org (Crossref), doi:10.1080/17513057.2019.1610187.

Wu, Qunfang, et al. "Danmaku: A New Paradigm of Social Interaction via Online Videos." *ACM Transactions on Social Computing*, vol. 2, no. 2, Oct. 2019, pp. 1–24. DOI.org (Crossref), doi:10.1145/3329485.

Xu, Yizhou. "The Postmodern Aesthetic of Chinese Online Comment Cultures." *Communication and the Public*, vol. 1, no. 4, Dec. 2016, pp. 436–51. DOI.org (Crossref), doi:10.1177/2057047316677839.

Yang, Yuhong. "The Danmaku Interface on Bilibili and the Recontextualised Translation Practice: A Semiotic Technology Perspective." *Social Semiotics*, vol. 30, no. 2, Mar. 2020, pp. 254–73. DOI.org (Crossref), doi:10.1080/10350330.2019.1630962.

Zhang, Weiyu. *The Internet and New Social Media Formation in China: Fandom Publics in the Making*. Routledge, 2016.

Zheng, Xiqing. "Cheers! Lonely Otakus: Bilibili, the Barrage Subtitles System and Fandom as Performance." *Henry Jenkins*, 22 June 2017. henryjenkins.org, <http://henryjenkins.org/blog/2017/6/15/cheers-lonely-otakus-bilibili-the-barrage-subtitles-system-and-fandom-as-performance>.