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► To cite this version:

Nathalie Pignard-Cheyne, Olivier Standaert, Lara van Dievoet, Loïc Ballarini. Experimenting with How Facebook's Algorithm Works. Feedback on a Case Study with Journalism Students. 5th World Journalism Education Congress Teaching Journalism During a Disruptive Age, World Journalism Education Council (WJEC), Jul 2019, Paris, France. pp.1032-1042. hal-02969006

HAL Id: hal-02969006

<https://hal.science/hal-02969006v1>

Submitted on 23 Nov 2020

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5th WORLD JOURNALISM
EDUCATION CONGRESS

9th-11th JULY 2019

**"TEACHING JOURNALISM
DURING A DISRUPTIVE AGE"**

CONFERENCE PROCEEDINGS WJEC PARIS

5th World Journalism Education Congress Proceedings
Marc-François BERNIER, Pascal GUENEE

Paper competition chairs :
Elanie STEYN – Imran PALASH

Editing:
Philippe DOUTEAU-ROULEAU

Coordination :
Sophie PUIG

Photos credits:
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ISBN :
978-2-9571786-0-5

World Journalism Education Congress 2019, Paris, 2020.

Experimenting with How Facebook’s Algorithm Works. Feedback on a Case Study with Journalism Students

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Abstract

This paper presents reflective feedback on a teaching experiment conducted over three consecutive years by the authors together with students pursuing a Master’s degree in journalism. The experiment brought together students and teachers from three universities belonging to the same international network of journalism schools (ARPPEJ, Association internationale de recherche sur les pratiques et la pédagogie du journalisme). Together, we investigated the way the algorithm of the social network Facebook organizes the distribution of news reports on its “News Feed.” This experiment tried to reflect some of the challenges that journalism schools are currently facing in their attempt to grasp the specific nature of digital journalism (Witschge et al., 2016; Eldridge & Franklin, 2018).

Rethinking the Boundaries Between Pedagogy, Academic Research, and Journalistic Practices

The debate between the theoretical or practical orientation of journalism studies is not a new one (Folkerts, 2014). The tension between educating journalists to become players in the democratic game and training them to work effectively in a media company is at the heart of sometimes radical positions taken by academic and professional circles (cf. Windschuttle, 1998 vs Bacon, 1998). While the movement tends to “academicize” journalism (Hermann, 2015), several attempts have been made to overcome this opposition by seeking convergence (Greenberg, 2007): ethnographic journalism (Hermann, 2015), community-oriented journalism (Mensing, 2010), or journalism school hack initiatives (Lynch, 2015).

As both teachers and researchers, we do of course attach particular importance to the fact that academic research and teaching should inform each other so as to remain relevant and innovative. And since we are training future journalists, we also know that the theoretical and analytical knowledge we can provide them with is more likely to be appropriated, discussed, and deepened

by the students if they can link it to concrete circumstances. Journalism students are often looking for a kind of technical training that would enable them to always report accurate facts in the ever-growing range of situations today's journalists have to deal with. Yet we believe that a good journalism program cannot limit itself to providing a toolbox, even if we were to teach the most advanced digital tools.

This approach is in line with Quinn's perspective, which, as early as 1999, called for a rethinking of journalism teaching in the information age. He advocated integrating "better critical thinking" with an "ability to cope in a fast-changing environment" and encouraging students "to work collaboratively" and "to adopt a global perspective" (Quinn, 1999). Thirty years later, this perspective is more relevant than ever and informs the pedagogical models of many journalism training courses.

What we try to do is to develop an educational approach to journalism that will encompass the variety of issues encountered in journalism. Technical skills would only be sufficient if journalism were a matter of technical reproduction. However, the production of news is also a matter of financial resources, working conditions, ethics and relations between different fields, including political and economic fields. It is because news and news media are considered a key element of democracy that our teaching programs try to combine theoretical and practical approaches (de Burgh, 2003). We favor the "learning by doing" methodology, thanks to which our students can tackle the issues of news-making both individually and collectively.

In September 2017, when we launched the ARPPEJ network bringing together our three journalism schools, the first educational issue we wanted to work on together was social networking sites and their journalistic challenges. We are all involved in academic research programs on the digital transformation of the news media, in which social networking platforms play an increasingly important role, and we share the conviction that they should find a corresponding place in our teaching programs. Obviously, they were already being studied in different courses dealing with the economics of news media, the professional practices of journalists, and online editorial strategies. But what about the daily routines of social networking sites? How could we make our students question the ways their feeds function? How could they experience the fact that the algorithms are not neutral instruments? How could we help them demonstrate not only that social networking sites are new ways of interaction, news circulation, and advertising, but that they also raise political questions even in the seemingly simple act of liking a friend's post?

The Implementation of the Experiment

To answer these questions by adopting an active teaching method, we set up an experiment, the third edition of which we carried out this year. In 2017 only AJM conducted it; UCLouvain and MJMN (Metz) took part in the 2018 and 2019 editions. We also chose to explore the Facebook algorithm in 2017 and 2018 and the Instagram algorithm in 2019.

While the implementation methods have changed slightly over the years, the basic principle has remained the same. Here is a description:

- Individually or in groups (depending on the year), students create accounts on the chosen platform, specifically for experimentation purposes. Each account has a profile associated with it. In the 2017 edition, we placed the experiment in the context of the French presidential election campaign. Each profile had to correspond to the political persuasion and ideas of one of the six main presidential candidates. Over the next two years, we defined profiles that were not associated with a specific event, but were highly thematic or polarized. For example, I am only interested in local information, or buzz or sport or content marked on the right, etc.
- In parallel, all accounts subscribed to the same list of about fifty media (in the broad sense, including traditional media, buzz media, and even a few sites that could be classified as producing “fake news” or highly biased content). This list would thus form the basis of the news feed of each account and would enable us to compare the influence of the traces, behaviors and activities associated with the account on the content that the algorithm offered the user.
- Once this framework had been created, the experiment could be carried out for a period of 4 to 6 weeks (the longer the experiment, the more interesting the results that can be observed and the more interpretations can be confirmed as to how the algorithm works). On a daily basis, students activated their accounts by performing classic actions on social networking sites: likes, shares, comments, status, etc., always ensuring a high degree of consistency with the defined profile (as close as possible to predefined ideal- type profiles). Following a common protocol and a predetermined schedule of actions, the profiles tested different hypotheses about the way Facebook’s algorithm sorts, selects, and publishes news media content for its users. For example: is buzz media content favored by the algorithm, to the detriment of more “serious” content? Is the importance of a like equivalent to that of a comment or a share?
- Day by day, the students recorded their actions in their notebooks, including screenshots, discussions, and personal thoughts about the progress of the experiment. There were regular get-togethers during courses to share and discuss individual or group observations, share interpretation leads, etc. At the end of the experiment, feedback sessions were organized with all the students, allowing teachers and students to compare their own experiment and to compile a stronger report on how the algorithm works in practice. Students’ changing attitudes towards the algorithm were compared with a selection of texts from the literature, ranging from scientific pieces to news reports (e.g. Facebook’s communication about the changes to its algorithm in early 2018) and position papers from various actors in the digital news ecosystem.

Collaborative Work on Algorithms: Benefits and Limitations

It quickly became apparent that we could try to conduct the experiment using a “learning by doing” approach. If our students could observe, with a structured protocol, that certain actions on social networking sites (or outside them when it is about online traces) lead to certain modifications of the feed’s structure and what they can read and view, we could then discuss with them the concepts of “filter bubble” and “echo chambers” or the dissemination of disinformation on another level.

It also seemed important to us to roll out this experiment within the emerging framework of ARPPEJ, because we have different and complementary backgrounds in research and teaching, and possibly because we felt stronger working as a group of four than alone against a giant like

Facebook. Working together had two further advantages: our experiment would be conducted by no fewer than 36 students and would cover three different countries. This sizeable number enabled us to identify trends in the functioning of the algorithm more easily and to formulate subtler hypotheses in the experiment. The international research field also allowed us to differentiate our hypotheses or to compare the results from France, Belgium, and Switzerland, the latter being two tinier markets in terms of news media outlets and number of social networking site members.

Talking about international collaboration immediately raises a key question, even though it does not concern the substance of the exchanges: that of the difficult temporal coordination of actions. Four researchers would always manage to communicate via email, use one cloud-based collaboration tool or another, and organize online video meetings. It was far more difficult to find the right moment for the experiment itself. Our three Master's programs have very different schedules and it was not easy to find enough weeks during which all of the students and teachers could focus on the experiment. For example, each school allows internships at different times of the year, and has other different milestones such as research theses, intensive weeks with professionals, end-of-year assignments, etc. The period chosen was more of a compromise than an ideal, and it had an impact on some of the students: those who were close to the submission deadline for their end-of-year assignment were less involved in the experiment, especially during the first year, where it was presented as an additional, ungraded exercise, while other students worked on the experiment and were graded on it during a less busy period.

The other major difficulty of this experiment is that it was conducted without any allocated budget, and mostly in addition to the other usual tasks of the staff. It would have been necessary to monitor the students' work on almost a daily basis in order to be able to follow the blocked accounts, the changes in the research hypotheses, and any momentary drop in students' motivation. Furthermore, there was not enough time at the end of the project for all of the students to pool their findings and draw collective conclusions. Each school did it for itself and only the teachers really discussed the findings. These limitations in the collaborative work were nonetheless partly compensated by the fact that every institution recorded its material and its principal results in shared documents, in order to leave them open to further analysis.

Exploring the Work of Algorithms: Ethical Issues

Since the exploration of Facebook's algorithm was based on daily activities (liking, sharing and commenting on new items), it was necessary to decide from the outset whether this exploration would be done with real accounts, i.e. those of the students taking the course, or with experimental accounts. This question raises a number of ethical considerations that we would like to briefly discuss. Of course, many other ethical aspects related to the exploration of algorithms in journalism education could be addressed, such as the often unfavorable position of media outlets in relation to GAFA, or the critical issue of fact-checking and criticism of content disseminated through social networks, which was one of the reasons why this experiment was set up. Due to space limitations and because the management of experimental accounts goes to the heart of the tools used in this context, we will limit the discussion to this issue.

The experimental protocol assigns particular profiles to the students, ranging from the most moderate to the most extreme (for example, the first experiment, conducted during the 2017 French

presidential election campaign, focused on the four principal candidates, one of whom was the leader of the French far-right party). In this context, it did not seem acceptable to ask students to proceed with the experiment using their real Facebook account. The implications would have been potentially numerous and problematic for those who had to interact with the accounts and pages of parties and candidates that did not reflect their political views. Even without any distortion between the real personality and the actions requested by the protocol, it was not our intention to ask students to reveal, implicitly or explicitly, their preferences and political leanings on topics debated in a period of high polarization (a presidential campaign in this case). Protecting students' real identities and opinions was therefore considered as a prerequisite, and a necessary means of focusing on Facebook's algorithm and not on the political debate.

The decision to work with experimental profiles led us to ask students to create these accounts. This preliminary step raised different questions, three of which are discussed below:

1. *What criteria should be used to create experimental accounts dedicated to our experiment?*
2. *On the basis of what criteria should a student be assigned a profile?*
3. *How can we make sure that the experimental accounts operated by students are realistic and credible enough, in order to assess whether "real" accounts would have been comparable and would have had similar interactions with the algorithm?*

1. The teaching team established a series of users' ideal-type profiles according to different areas of interest and preferences. In order to ensure a high level of comparability, only the areas of interest differentiated the experimental profiles, as well as the gender variable (aiming at equality between the number of women and men). The choice to work with "fake" accounts was therefore very well defined and prepared. During the first edition of the experiment, each group of students had to follow and support one of the four main candidates in the 2017 French presidential election. During the second edition (in 2018), which involved more students and was not focused on a single upcoming event, the list of areas of interest was extended to a larger number of profiles usually encountered on social media. Other parameters, such as the profile picture, were left to the students' discretion, with some instructions and advice to avoid accounts suggesting that they were bots (being perceived as an anonymous account, in this regard, was problematic). These instructions for the creation of accounts seemed essential to us: without such guidelines, the possibilities would have been so vast that the profiles could have caused some technical problems (blockages by Facebook happen frequently), problems of comparability (a key parameter in our protocol), but also ethical problems: how far can we go when creating experimental accounts and virtual characters? How far can we go in defining "extreme profiles" (conspiracy, supremacists or extremists)? Could we create profiles presented as minors, or profiles that were openly violent towards some minorities or ideas?

How can we make sure that the creation of virtual profiles does not become a game, and does not encourage behavior that students would otherwise find unacceptable, in a digital environment where anonymity and the use of fake identities pose persistent and potentially serious problems, particularly for journalists and people involved in the production of verified and confirmed information? To avoid opening up a Pandora's box, the profiles were therefore defined beforehand and the teaching team checked their parameters before launching the experiment.

2. The assignment of standard profiles to groups of students is potentially a second point that can be problematic. Some profiles inspire students more than others; some students recognize themselves more in some profiles and distance themselves more from others. As we wished to avoid personal preferences playing a role in the choice of profiles to be embodied, there was a possibility of imposing attributes. However (and fortunately), this option was not necessary: the students were able to choose their profile freely as long as the distribution was done in a concerted way and did not create any difficulty such as a refusal to embody this or that profile. This is undoubtedly the advantage of experimental profiles: they allow students to project themselves into profiles that are not their own without causing any identification problems. The protocol of any experiment based on borrowing virtual profiles should nevertheless anticipate scenarios such as refusals or reluctance, especially if the purpose of the experiment is precisely to test what happens with a wide range of profiles, from the most moderate to the most radical. These potential problems should therefore be dealt with and discussed with the students. So far, we have not encountered any major problems related to the allocation of experimental accounts.

3. Finally, the third issue relating to the creation of experimental accounts concerns the credibility of the profiles and the protocol. Credibility is mainly based on the notion of likelihood (Marion, 2018), that is to say something that seems true and real without necessarily being so: do the characteristics of the accounts come close enough to those of real accounts? Are they also plausible in the eyes of Facebook, which has stepped up efforts to track down fake accounts? The technical difficulties sometimes encountered (mainly to finalize the creation of experimental accounts), as well as some analyses performed by students after the experiment, demonstrate, if necessary, that no experimental account can encompass the depth and complexity of a “real” person. This naturally raises questions about the validity and relevance of the observations collected during the experiment. The interpretation of the data therefore focused as closely as possible on this aspect, as well as on other elements limiting the scope of the results, such as time limitations. With regard to the schedule of actions fixed by the common protocol, the question of likelihood faces the same limitations as those of the profiles: the students performed a whole series of actions that are among the most common and elementary on Facebook (comment, share and like). The pace at which these actions were planned was also very probable. Nevertheless, the problem remains: considering the complexity and unpredictability of a real person’s actions, we cannot claim that the gap between a virtual and a real profile is closed. That said, interactions between the experimental accounts and the algorithm do not prevent students from observing things that are potentially relevant to real accounts. Moreover, students could compare the development of their experimental account with everything they had already observed informally on their real account. However, the ethical dimension of this experiment involves keeping in mind that those differences probably remain and that they must be discussed and incorporated as much as possible into the different phases of the experiment.

These issues relating to the use of experimental accounts raise more fundamental questions about the conditions under which to use hidden or fabricated identities to explore what “real people” do (on social networks, for example). In our case, virtual accounts were both necessary and problematic. What is often discussed in academic research and, of course, in journalistic training, could help students heighten their sensitivity to the consequences of using another identity. The ethical practical implications can be discussed at all stages of the experiment: the way it is devised and set up, the way it is presented and justified to students, the way it is implemented, and, finally, the way in which the results are analyzed and discussed. These questions also confront students

with their ability to measure the effects and consequences of this parameter on the pedagogical project as a whole. The notebooks used by the students, as well as the work evaluated in this project, do not indicate a developed reflexivity about the issue of anonymity. However, more generally, in journalistic practices and professional ethics, the question of anonymity (for instance with sources and with vulnerable people) and the journalist's identity (undercover practices etc.) has long been the subject of reflection and formalization by researchers, regulatory authorities, and practitioners. It would be useful to address these well-established rules and guidelines for the social media ecosystem, where journalism students spend a lot of time, and where rules and practices about anonymity are far less developed than in the field. In this sense, the exploration of Facebook's algorithm has also been a way to explore ethical considerations about the role and resources of the researcher – and future journalists.

Technical Limitations and Future Prospects

Will it be feasible to replicate this kind of experiment in the near future? And, if so, to what extent? The 2018 experiment faced several limitations. It has become increasingly difficult to create a Facebook profile using a fake identity without it being blocked. Moreover, even the private browsing setting proves to be insufficient in preventing Facebook from uncovering the researcher's identity.

Many of the dedicated accounts that the students created were subject to security checks, either during the upstream preparation or during the experiment. Several groups of students were asked to add a phone number or to provide a genuine profile picture showing the profile owner's face. Some of these checks seem to be the result of many different computers being used to manage the same account. Some of them led to a blocked account or a probable link between the experimental profile and the student's own profile.

This is consistent with what Facebook has stated on several occasions. In the wake of fake news and data collection scandals, Facebook has been tightening up security, tracking down fake accounts and shutting them down. We have reason to suspect that the creation of accounts for this kind of experiment will only become harder. Speaking at the DLD (Digital-Life-Design) conference in Munich in January 2019, Facebook COO Sheryl Sandberg said the company is now blocking one million fake accounts a day.

These limitations led the teaching staff to adapt the protocol of the 2019 experiment. Instagram was selected as an alternative platform for the study of the impact of a social network algorithm on news consumption. Four main reasons prompted this choice:

- ***Profile creation***

Having more than one Instagram profile is very common. Instagram does not distinguish between private accounts and pages, a distinction that Facebook relies on to differentiate individuals and organizations or brands. It is possible to manage a personal and a professional profile or even multiple personal profiles. Using Instagram allowed us to create experimental profiles without running the risk of those accounts being shut down.

- *Account management*

Instagram makes it easy and convenient to manage multiple profiles from its app. The downside is that creating and managing a second profile from your mobile phone makes it impossible to activate the private browsing setting. It gives away your real identity, a variable that has to be considered when analyzing the collected data.

- *Students' interest*

Discussions with students made it clear that an Instagram experiment was relevant: they tend to use it more frequently than Facebook, and for different purposes: some students told us that Instagram was their favorite social network, which means that they use it on a near-daily basis for interactions with friends, a role that Facebook tends to play less and less.

- *New questions*

The high number of influencers, stories and brand pages on Instagram led to renewed questioning about news content visibility and the dissemination of information. This was even more justified, as, after two years of experiments on Facebook's algorithm, and due to growing concerns about disinformation, we clearly felt that it was becoming more difficult to teach students something new. Exploring a new social media outlet was therefore a relevant way to link students' habits, evidence from the first two experiments, and the research question of the influence of algorithms.

Another change was also made: students worked independently, each managing one Instagram account. This meant that we could avoid connections from multiple devices, which might have raised concerns. In the end, the first experiment with Instagram went ahead without any major technical problems, which was clearly what we were looking for when we decided to work on this social network. Students' observations highlighted some mechanisms in the structuring of the stories, depending on their user profile and the way they engage with friends and content. Many of them concluded that there is consistency between their profile and how Instagram organizes the content. Sponsored content, the roles of hashtags, and the influence of friends versus media pages were also discussed in more or less the same way as during the two first experiments on Facebook. Since the scientific literature on Instagram's ecosystem is far less developed than it is for Facebook, it was more difficult, for both students and teachers, to interpret and contextualize the data collected.

In considering possible future steps for this kind of teaching experiment, we are also confronted with the following question: Could we – and should we – consider formal and predefined collaboration with Facebook to conduct an experiment like the one we discussed?

If Facebook were to accept collaboration, it would certainly facilitate the set-up phase and free us from most of the practical problems we faced. Some insight and feedback from Facebook could be very illuminating for future journalists. It would, however, raise other concerns. The focus of our experiment is the role of algorithms and their impact on news distribution and visibility. Facebook remains very secretive about the way its algorithm works, so we would never know for certain that they had not interfered with the experiment. Convincing Facebook staff that our experiment has added value for them would also be very complicated since the opacity of the algorithm is part of its DNA. In other words, developing a sure and transparent partnership with such a big player is, in our view, very unlikely.

Another way to reduce the risk of technical issues would be to manage one profile per institution only, and to access it from a fixed device and location. Students could work in shifts to upload content to the profile and take specific actions. This could even be done over the course of a year (or two) with the same group of students. If applied properly, this protocol would have advantages in terms of comparability and realism (thanks to a long-term perspective).

Conclusion

In conclusion, this three-year collaboration on the role and influence of algorithms offers a tailor-made framework within which to discuss the role of journalism schools in dealing with players such as social networks (Facebook, Twitter, Snapchat, Instagram, etc.), which journalists use more and more without precisely knowing how they actually work. The question that arises is that of the pedagogical strategy to adopt towards platforms whose opacity seems to be part of their very DNA.

In this paper, we have shown how a “learning by doing” approach can help students acknowledge the crucial importance of algorithms through a dedicated experiment. Before the start of this experiment, most of them only had a vague idea of how social media construct a certain view on the most important news items. Learning by doing mostly means learning by oneself, in a very practical way. Autonomy (following the protocol and accounting for the reality observed) and collaboration (sharing, nuancing, and presenting collective results) were at the heart of the skills used by the students.

We have also discussed the absolute necessity of careful preparation: being as clear as possible about the objectives and the hypotheses we wanted to test; testing the accounts and the protocol; organizing the mentoring, the follow-up, and the feedback; providing a theoretical framework in order to enrich practices with the literature (and vice versa); and incorporating such an experiment into the broader context of a Master’s degree in journalism: All these elements shape the way this kind of experiment can make sense to students. In many ways, the reflexivity and awareness about some questions (see the ethical challenges, for instance) could have been improved, or better anticipated. Technical limitations and the unavoidable variation in levels of commitment among students made it difficult to reliably compare results. And, of course, the fact that we were not able to establish any kind of collaboration with Facebook or Instagram reinforces the impression that we were working in the dark to some extent.

Finally, however, what a journalism school should teach its students is precisely how to deal with the unpredictable, the untold and the hidden faces of reality. In this context, algorithms are a very

challenging exercise. Is journalism not about finding and telling the truth, and is journalism education not about how we can discover the truth, with what kind of tools, methods, and values? In this context, we have shown our students how we, their teachers, organize a methodical and accountable exploration of an opaque reality. We have explained how we prepare a concrete research project, how we define it, and how we evaluate the results. Lastly, we have discussed it with our students, and their feedback, in turn, highlighted many limitations that we did not fully anticipate. Exploring Facebook's algorithm was not just about improving their criticism and awareness, despite the fact this seems very necessary for future journalists. It was, above all, a way to bring research skills and concerns to the heart of a journalistic training program, and to realize, once again, that academic research and advanced education, in journalism, share very comparable challenges, methods, and constraints.

About the Authors

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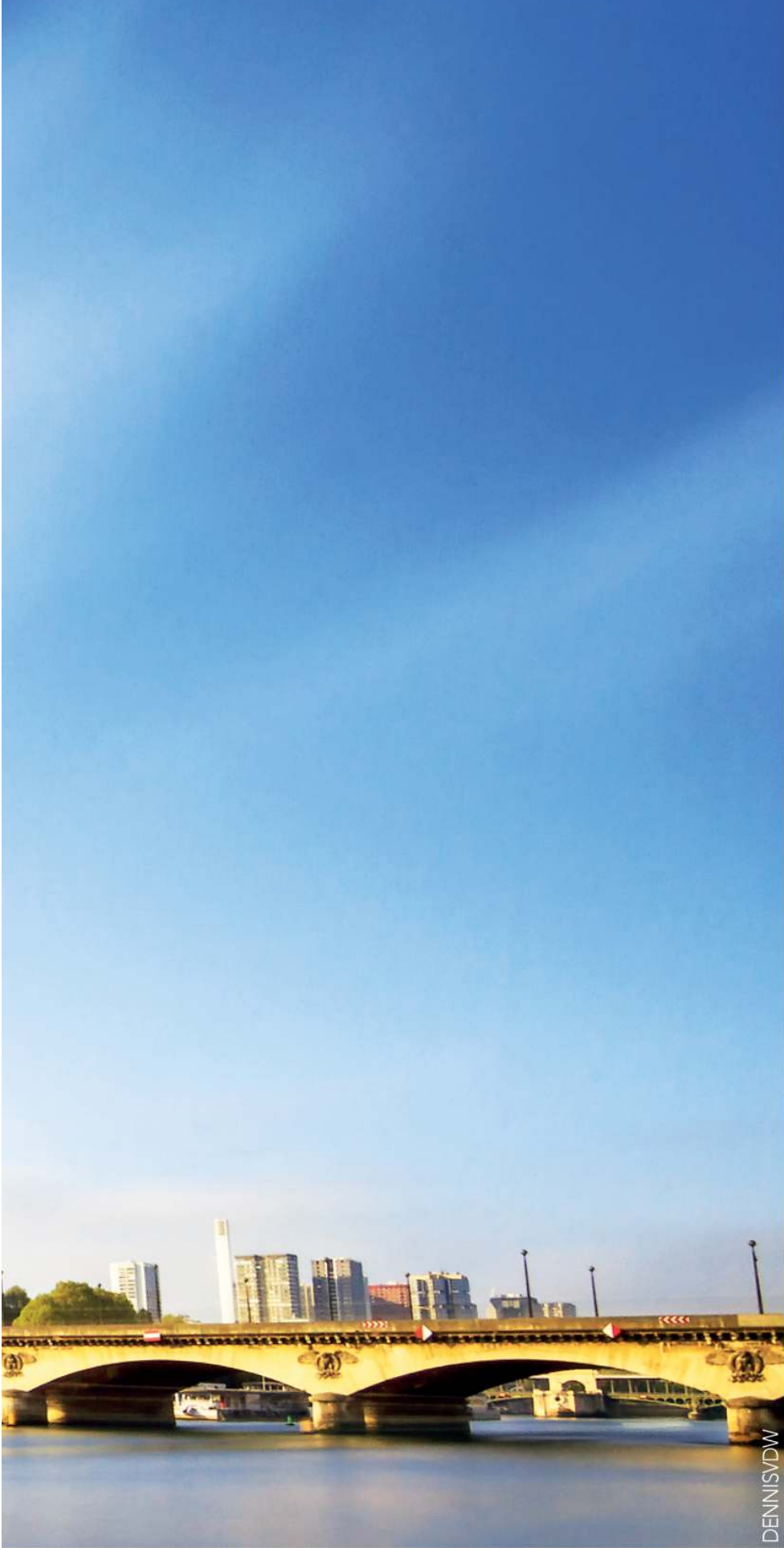
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