Final report

Version 1 - 3 February 2021

Final report

File number:	451-17-028
Project title:	From Ownership to Access: The Implications of Streaming Digital Content on Consumers, Sellers, and Artists
Project leader:	H. Datta

Summary of the results

Give a concise summary of the progress of the project throughout the entire project period.

In three interlinked subprojects, I investigate how the emergence of on-demand music streaming affected consumers and sellers of digital content. A fourth subproject documents the process of collecting publicly available data from the internet, as used throughout the project.

In year 1 (January 2018 – January 2019), I focused on the first subproject. In particular, I assessed whether consumers that start using a streaming service would listen to more of the same content than other users (i.e., in line with taste homogeneity) or less of the same content (i.e., in line with taste fragmentation). To measure consumption across consumers more accurately, I updated the metadata used in Datta et al. (2018).[1] During a research visit at Duke University, I discussed the project with experts in the field. A highlight was the invitation by the Austrian Presidency of the European Union to become a panel member at the conference "Challenging (the) Content," which sharpened the relevance of my work for public policy in the digital economy.[2]

In year 2 (January 2019 – January 2020), I submitted the working paper of subproject 1 to a journal. As new work undermined the contribution of subproject 2[3], I focused on subproject 3, i.e., to investigate how streaming affects the supply of new music. I started collecting and documenting new publicly available data through web scraping[4] and cooperated with Chartmetric.com to obtain artist-level panel data. I also discovered how the data could shed light on the power balance between content providers (i.e., music labels and artists) and platform operators (e.g., Spotify) – an important theme raised at "Challenging (the) Content," which I eventually study in subproject 2.

In year 3 (January 2020 – January 2021), subproject 1 was rejected for publication after two revisions.[5] My work on subprojects 2 and 3 continued. I participated in a panel discussion with the CEO of Spotify Benelux

[1] Datta, Hannes, George Knox and Bart J. Bronnenberg (2018), "Changing their tune: How consumers' adoption of online streaming affects music consumption and discovery," *Marketing Science*, 37(1), 5-21. https://doi.org/10.1287/mksc.2017.1051.

[2] Panel membership on "Economic Potential of New Data Appliances" at the EU conference "Challenging (the) Content", Vienna, 8-9 October 2018, https://vimeo.com/294182076#t=7217s.

[3] The notion of localization versus globalization was studied in Aguiar and Waldfogel (2018), https://doi.org/10.1007/s10824-017-9315-z.

[4] For example, weekly lists of all releases of albums and singles to Spotify in the United States, 2015-2018 (https://doi.org/10.34894/DX857S).

[5] The paper received a reject & resubmit decision 29 March, 2020, and – after a careful revision – a reject decision on 14 October, 2020. The paper continuous to be revised for a new submission.

and discussed my preliminary research findings.[6] The "Universiteit van Nederland" produced a video and podcast about my research. I gave workshops and launched a website with tutorials and instruction manuals for researchers and students, focusing on the *why* and *how* of conducting open science.[7] I documented my data for public reuse. Finally, I contributed to an article that develops a workflow for collecting publicly available data from the internet – a key data source used throughout my work (subproject 4).

During an extension period (January 2021 – May 2021)[8], my work on subprojects 2-4 continued. Given the tight deadline for the journal submission of subproject 4, working papers for subprojects 2 and 3 are not yet completed. Finally, my work led to the development of two open education classes.[9]

To sum up, working on this project led to two working papers[10] and two papers in an advanced stage. I have discussed my work with policymakers and practitioners and presented my work to the national and international academic community. I have disseminated my research findings in public lectures and interviews, and gave workshops and launched a platform for students and researchers to learn and practice open science.

Which risks or hindrances did you encounter? How did you tackle or resolve these?

1. Subproject 3 relied on an industry cooperation. Because my contact unexpectedly left the organization, a partnership became infeasible. Instead, I collected data through web scraping and APIs and started collaborating with Chartmetric.com to get programmatic access to novel data.
2. I faced competition from other research groups, which ultimately led me to abandon my original idea for subproject 2. Instead, I used input from the EU conference "Challenging (the) Content" to reposition my work. In line with the primary goal of this project, the study measures the power balance between digital platforms and their suppliers. It has already received ample attention in the field (e.g., invited national and international talks).

Which opportunities arose? And (how) did you make use of these?

1. Working on this project equipped me with valuable experience collecting publicly available data using web scraping and APIs. When interacting with students and fellow researchers, though, I realized there was no single comprehensive source that documents the practice of collecting web

[6] "De grote Like Show", panel discussion with Cynthia Liem (TU Delft) and Wilbert Mutsaers (CEO Spotify Benelux) at Felix Meritis (Amsterdam, 9 October 2020).

[7] Eventually, the material (https://github.com/tilburgsciencehub/deprecated-website/) became part of an initiative to enhance the research infrastructure at my school and led to the launch of https://tilburgsciencehub.com, a platform for students and researchers to learn open science. Unlike existing material (such as workshop material developed by http://software-carpentry.org), the platform focuses on the importance of open science to work more efficiently on empirical research projects, and hence has the potential to convince a larger target group about its merits.

[8] In particular, during the first wave of the Corona pandemic, I experienced delays in my project due to the closure of schools and day cares; also, several important events had to be rescheduled (e.g., a talk at London School of Economics, the panel discussion with the CEO of Spotify Benelux, and the production of "Universiteit van Nederland").

[9] Data preparation and Workflow Management (available at https://dprep.hannesdatta.com) and "Online Data Collection and Management" (available at https://odcm.hannesdatta.com).

[10] Subproject 1 on the homogenization of music consumption (https://research.tilburguniversity.edu/en/publications/streaming-services-and-the-homogenization-of-music-consumption) and subproject 4 on collecting web data (https://dx.doi.org/10.2139/ssrn.3820666).

data for empirical researchers. The editors of the *Journal of Marketing* expressed their enthusiasm about a paper that guides researchers in sensibly collecting web data. Given my expertise and the potential impact of such an article on the field, I decided to allocate time to work on it.

2. Media coverage (e.g., fastcompany.com in 2018, the nomination of New Scientist Research Talent in 2019) boosted my national and international recognition as an expert on online music streaming. I provided input to a report that eventually became part of a letter to the Dutch parliament[11]. My expertise was sought for court cases on private copying in The Netherlands ("thuiskopie")[12]. Interacting with the media and lawyers further strengthened my domain expertise and allowed me to increase the relevance of my research for practitioners and policy makers.

Did the following aspects proceed according to plan? Please provide details below (optional).

Aspect		Explanation	Possible consequences
Realisation study design:	☒ yes ☐ no	Subproject 1 – yes Study 2 – no Subproject 3 – yes, but used different data	Subproject 2: Instead of focusing on how streaming affects local versus global content consumption, this project investigates the power balance between digital platforms and content suppliers. Subproject 3: Instead of using Dutch data, the study now uses data from the US.
Realising objectives:	☒ yes ☐ no	The fundamental goal of this project was to shed light on how the transition from ownership to access affected stakeholders (consumers, suppliers, artists) in the industry. All three subprojects inform this key research goal.	*Explanation*

[11] Expert interview for "Verheffing of verstoring? Effecten stimuleringsmaatregelen audiovisuele productie in Nederland"; report commissioned by the Dutch Ministry for Education, Culture and Science (publication number: 2018.077-1833; January 2019).

[12] In particular, the law firm Hofhuis Alkema Groen (Amsterdam) commissioned three reports (1 June 2019, 10 September 2019, 11 January 2021).

Completion output:	☐ yes ☒ no	Subproject 1: manuscript available (but unpublished, see footnote 5). The data provider asked to keep data confidential. Subprojects 2-3: presented key results at various conferences and talks; now writing up the paper for journal submission. Subproject 4: working paper available (currently under revision).	Subproject 1: Raw data cannot be published as per the request of the data provider. A working paper is publicly available—revision for new submission in progress. Subproject 2: Working paper not completed yet. Prepared underlying raw data for publication. Published key algorithms. Subproject 3: Working paper not finished yet. Dataset published.
Activities in the area of knowledge utilisation:	☒ yes ☐ no ☐ n/a	1. Discussed results with key stakeholders in the industry (e.g., EU conference on digital content, a panel discussion with CEO of Spotify Benelux, several meetings with major-label representatives); contact with journalists. 2. Knowledge was disseminated to the general public via a lecture at Universiteit van Nederland (video and podcast format). Radio interviews were given. 3. Experience in reproducible science led to workshops and a new platform for teaching students and researchers about open science. 4. Release of data for reuse after an embargo period, except for subproject 1. Code repositories and algorithms were made available.	*Explanation*

Collaboration with partners:	☐ yes ☒ no ☐ n/a	The proposed collaboration did not take place because the contact person left the organization.	Collaborated with Chartmetric.com instead. Further, collected publicly available data from the US, affecting the period (now 2015-2018 instead of a more extended period) and country studied (now the US, instead of NL).
Research data management:	☒ yes ☐ no	I proposed a combination of long-term secure storage of raw data on infrastructure operated by Surf/SurfSara, with temporary computation and storage facilities at commercial cloud services.	The proposed solution for long-term storage of raw data was discontinued during the project (beehub.nl). Given my experience with object storage at AWS S3, I used commercial cloud services instead, all of which were located in the European Union. Archiving of key data sets done, but to be updated once manuscripts are published.

Verified by NWO – Follow-up actions progress planning

To be completed by NWO: follow-up actions

Personnel information

Check the appointment details of the persons involved in your project in ISAAC via the tab Project members.

- Does the appointment duration fall between the start and end date of the project?
- Is the position for the appointment in accordance with the appointments in the grant awarded?

Is the size of the appointment in fte in accordance with the size of the appointments allocated in the grant awarded?

To be ticked off by the project leader
Personnel details checked and approved:
☒ yes
☐ no: Any changes in personnel should be submitted for approval by means of a request for change form

Verified by NWO - Personnel information

Are the project members entered in ISAAC in accordance with the grant?	
☐ yes	
☐ no: Was a request for change submitted?	*If no:* ☐ Request for change approved

	☐ Action

Additional comments from NWO:

Comments (to be completed by NWO)

Career development

In case of a Talent Programme (previously Innovational Research Incentives Scheme), please detail your position prior to the project, during and after the project in the below overview.

☐ Not applicable ((this project is not a Talent Programme (previously Innovational Research Incentives Scheme))

	Type of position	Type of appointment
Prior to project:	UD (assistant professor)	fixed term - tenure track
During project:	UHD (associate professor)	permanent position
After project:	UHD (associate professor)	permanent position

Additional comments from the project leader

At an international level, I became a member of the Marketing Science Institute's Young Scholar program (class of 2019). Further, I was invited to the editorial review boards of the *Journal of Marketing* (starting 2020), the *International Journal of Research in Marketing* (starting 2021), and the *Schmalenbach Journal of Business Research* (starting 2021). Further, I continued my active role as an ad-hoc reviewer (4-6 reviews per year) for *Marketing Science* and *Journal of Marketing Research*, underscoring my standing in the field.

At the national level, I was among the top 25 researchers nominated for New Scientist Research Talent (2019). Further, I made it to the final interview round for membership in the KNAW De Jonge Akademie (2020) but was not selected.

At Tilburg University, I received tenure and promotion to Associate Professor in 2018. Further, I was appointed a member of Tilburg University Young Academy in 2020. For my initiatives to disseminate open science skills, I received the Research Valorization Award from Tilburg School of Economics and Management (2020).

Summary for non-experts of the progress

Summaries for non-experts are published on your project page on the NWO website. This page also contains your Summary for non-experts from the proposal, the output entered and any previous updates.
You should list your final results via your project in ISAAC via the tab Reports/Summary for non-experts update.

Verified by NWO – Summary for non-experts

Are the final results mentioned correctly in ISAAC?
☐ yes ☐ no: *Explanation*

Patents

Have results been generated that are eligible for protection by a patent?
☐ yes: inform NWO, the project participants and possible users and discuss an invention disclosure form with the parties involved in so far as this has not yet happened.
☒ no

Impact of the activities

Scientific Impact

Describe the added value and/or innovative aspects and/or highlights of the research results for science.

In **subproject 1**, I assess whether platforms may homogenize consumption (e.g., by steering consumers to the same content) or instead fragment consumption (e.g., by providing personalized recommendations). To study this issue, I analyzed music consumption for pairs of consumers when they adopt Spotify, a major music streaming platform. I find that Spotify adoption indeed makes listening behavior more similar across consumers. I interpret this effect by decomposing it into two parts: first, Spotify expands total music consumption, increasing similarity even without any platform-directed coordination. Second, after adjusting for increased consumption, the adoption of Spotify decreases similarity. Rather than steering large groups of consumers to the same content, the results suggest streaming services expand yet individualize listening behavior, a previously undocumented finding in the literature.[13]

[1] Knox, George and Hannes Datta (2020), "Streaming Services and the Homogenization of Music Consumption," Working paper, available at https://research.tilburguniversity.edu/en/publications/streaming-services-and-the-homogenization-of-music-consumption.

In **subproject 2**, I model the drivers of playlist demand on Spotify to understand the power balance between streaming platforms and their content suppliers. Using daily consumption and promotion data of in total 1.2 million playlists on Spotify, I estimate a structural demand model of users' playlist choice and decompose playlist demand into three major drivers: (i) persistent time-invariant user preferences for playlists, (ii) users' responsiveness to featured playlists on the platform, and (iii) preferences for the popularity of playlist content, depending on which content is available on a playlist over time. The results show strong, persistent consumer tastes for playlists curated by the platform. Users are less responsive to changes in the content popularity of playlists over time. Counterfactual simulations show that revenues of content producers (the major music labels Sony, Universal, and Warner) are much more dependent on being added to top Spotify playlists than platform revenues depend on the availability of popular content from these labels. To the best of my knowledge, this study is the first analysis that compares the power of music streaming platforms with those of their content suppliers.[14]

[2] Pachali, Max and Hannes Datta (2021), "What drives playlist demand on Spotify? Implications for the power balance between content producers and the platform." Working paper to become available

[13] Presented at the Media & Digitization Meeting, University of Zürich, Switzerland (25 October 2019), Duke University, Fuqua School of Business (24 October 2018), EMAC Conference, Glasgow, Scotland (1 June 2018), Eindhoven University (28 February 2018), and Goethe University Frankfurt (30 January 2018).
[14] Presented at University of Zürich (1 December 2020), Amsterdam Business School (28 October 2020), and London School of Economics (LSE) (19 June 2020).

by the end of 2021.

[3] Datta, Hannes (2021), "The playlist ecosystem at Spotify," dataset collected for this study available at https://doi.org/10.34894/4UBBAW (DOI reserved; to be made available after publication).

[4] Klaasse Bos, Roy, and Hannes Datta (2021), "Categorization of Playlists, "algorithm available at https://doi.org/10.5281/zenodo.5153522.

[5] Datta, Hannes (2021), "musicMetadata," algorithm available at https://doi.org/10.5281/zenodo.5153558.

In **subproject 3**, I investigate how artists have changed their distribution strategy after joining Spotify. In particular, artists may respond to platform incentives to maximize their number of streams, for example, by releasing new content more frequently or shortening the length of one's songs. To this extent, I collected a unique panel data set composed of individual artists' complete release histories for a random sample of US-based artists that started distributing music to Spotify between 2015-2018. I find artists have doubled total music production (measured by the number of tracks released) compared to before joining Spotify. This effect primarily comes from an increase in the number of tracks on an album and not from increased availability of single releases on the platform. While pundits have argued that artists respond to platform incentives by decreasing the length of their songs, the results show that the average song length in the sample has not changed due to artists decision to distribute music on Spotify.

[6] Alagoz, Nazīl, Hannes Datta and George Knox (2021), "Platform Incentives and Commercial Music Production," working paper not yet available.

[7] Datta, Hannes (2021), "Album and single releases to Spotify (2015-2018)", dataset collected for this study available at https://doi.org/10.34894/DX857S.

In **subproject 4**, I document the various design decisions involved in collecting web data. Even though marketing researchers increasingly use web scraping and Application Programming Interfaces (APIs) to collect publicly available data from the internet, there is a lack of awareness and understanding of the design decisions in such data collections, which threatens the credibility of research findings based on web data. Therefore, this article develops a systematic workflow that guides junior researchers across the different stages of collecting web data. The workflow is accompanied by a comprehensive review of web data in marketing research, identifying common themes of how web data has enriched past work. Finally, I highlight promising avenues for how future work might leverage web data to address important marketing questions.

[8] Boegershausen, Johannes, Abhishek Borah, Hannes Datta and Andrew T. Stephen (2021), "Fields of Gold: Generating Relevant and Credible Insights Via Web Scraping and APIs," working paper available at http://dx.doi.org/10.2139/ssrn.3820666.

Societal impact

Describe the (progress of the) activities in the area of knowledge utilisation, which increase the chances of societal impact. Also explain any opportunities that may have presented themselves.

Working on this project allowed me to gain further national and international recognition for studying online streaming, which opened up several opportunities for participating in the public debate.

1) The Austrian Presidency of the European Union invited me to become a panel member at the EU conference "Challenging (the) Content" (October 2018); I used the opportunity to advocate for open access to data for academic research, so that researchers can investigate important societal questions concerning the digital economy that otherwise would be infeasible to study.[15]
2) In March 2019, I presented my preliminary research findings to students at the Codarts University of the Arts in Rotterdam and engaged in an active discussion about algorithms and the power of digital platforms to promote musicians' careers.[16]
3) In October 2020, I participated in a panel discussion with the CEO of Spotify Benelux to discuss the role algorithms have in affecting consumption at the world's largest platform for music streaming.[17] The debate was insightful for participants and provided me with novel insights on the role of independent and major labels at streaming services.
4) In December 2020, the "Universiteit van Nederland" (UvNL) launched a video and podcast, concisely summarizing my research findings.[18] Working alongside the team of UvNL allowed me to sharpen my public-speaking skills, which helped me professionalize videos posted on my YouTube channel.[19]

Next to participating in public discussions and giving lectures, I was regularly invited to provide my expert opinion on issues concerning online streaming.

5) My commentary was sought for a report commissioned by the Dutch Ministry for Education, Culture and Science, which eventually became the annex to a letter to the Dutch parliament in December 2019.[20]
6) I worked on three commissioned reports for two court cases to improve the accuracy of damage calculations for rightsholders of digital content (e.g., music, movies, eBooks) due to private copying ("thuiskopie") in The Netherlands.[21]
7) I participated in the discussion about artist compensation mechanisms at streaming services.[22] My research was covered in news outlets and blogs throughout the project period.[23]

[15] Panel membership on "Economic Potential of New Data Appliances" at the EU conference "Challenging (the) Content", Vienna, 8-9 October 2018, https://vimeo.com/294182076#t=7217s.
[16] Codarts Project Week on "Sociology of Popular Music", Rotterdam (27 March 2019).
[17] "De grote Like Show", panel discussion with Cynthia Liem (TU Delft) and Wilbert Mutsaers (CEO Spotify Benelux) at Felix Meritis (Amsterdam, 9 October 2020).
[18] "Wie bepaald jouw muzieksmaak?", produced by Universiteit van Nederland (31 December 2020); available on YouTube (https://youtu.be/EbmCVRkmCAc) and as a podcast (https://open.spotify.com/show/0z2ydI7p9BA6wxFiq8U0lF?si=ty6sDj2XQoOoBj8IKKxAXw and https://podcasts.apple.com/nl/podcast/de-universiteit-van-nederland-podcast/id1385505692?mt=2).
[19] https://youtube.com/c/hannesdatta
[20] Expert interview for "Verheffing of verstoring? Effecten stimuleringsmaatregelen audiovisuele productie in Nederland"; report commissioned by the Dutch Ministry for Education, Culture and Science (publication number: 2018.077-1833; January 2019), annex to letter to the Dutch parliament dated 19 December 2019)
[21] Reports are available at https://doi.org/10.5281/zenodo.5159547 (June 2019), https://doi.org/10.5281/zenodo.5159541 (September 2019), and https://doi.org/10.5281/zenodo.5159562 (January 2021). Upon request by the commissioning law firm, reports become fully available in the public domain after an embargo period ending on 28 February 2022.
[22] DeutschlandFunk Kultur (Germany), available at https://ondemand-mp3.dradio.de/file/dradio/2020/02/18/musik_streaming_wie_saehe_ein_gerechtes_modell_aus_drk_20200218_1609_ade7fb31.mp3 (February 2020).
[23] E.g., https://www.fastcompany.com/90270574/how-spotify-and-other-streaming-services-broaden-our-musical-horizons (November 2018), https://www.iphoned.nl/nieuws/spotify-effect-achtergrond/ (April 2019), and

Finally, an important part of my project was the dissemination of open science skills.

8) I have developed a series of manuals and tutorials on *why* open science can help researchers work more efficiently on empirical research projects. The material is now part of https://tilburgsciencehub.com, an initiative to enhance the Tilburg School of Economics and Management research infrastructure. The platform is free to use and attracts hundreds of weekly visitors, both from The Netherlands and abroad, the learn and practice open science.
9) Throughout the development process of the material, I have given two workshops to professionals at the Jheronimus Academy of Data Science in 's-Hertogenbosch (June 2019 and May/June 2020), and three workshops to Ph.D. students and researchers (June 2018 and January 2019 in Tilburg, and March 2019 in Hamburg, Germany).
10) I have developed two courses for students to use open science methods and open data. The courses were initially taught at Tilburg University to students of the Marketing Analytics program in April-June 2021 and are publicly available as open education classes.[24]
11) My expertise in collecting publicly available data from the internet—data used in each of the subprojects—led to a method-focused article on the process of collecting web data.
12) Finally, I have released algorithms that I have co-developed with data scientists and practitioners at firms, and that are used in subprojects 2-3.[25]

Description

Verified by NWO - Impact of the activities

Follow-up actions (to be completed by NWO)

Publications and other forms of output

Output should be entered via your project in ISAAC via the tab Product. Here, you should also state whether it concerns an Open Access publication and you can add a DOI/URL.

Are all scientific publications and other forms of output listed in ISAAC?	
☒	yes
☐	no*

** Enter these details no later than four weeks after submitting this report.*

Is all output published (as intended in the application)?	
☐	yes
☒	If no, please give an overview of output to come, including a planning.

https://www.trouw.nl/cultuur-media/waarom-we-ondanks-alles-nog-steeds-massaal-naar-michael-jackson-luisteren~b7ebe07a/ (June 2021).

[24] "Data preparation and workflow management" (https://dprep.hannesdatta.com, archived at https://zenodo.org/badge/latestdoi/292224306) and "Online Data Collection and Management" (https://odcm.hannesdatta.com, archived at https://doi.org/10.5281/zenodo.5011458).

[25] An association-rule mining algorithm to categorize 1.2 playlists in about 40 "categories" of music consumption (e.g., "sleep", "mood", "pop", "rock"), available at https://doi.org/10.5281/zenodo.5153522. An R package to map music label names into their (major-label) parent brands, available at https://doi.org/10.5281/zenodo.5153558.

	[2] Pachali, Max and Hannes Datta (2021), "What drives playlist demand on Spotify? Implications for the power balance between content producers and the platform." Working paper to become available by the end of 2021. [6] Alagoz, Nazīl, Hannes Datta and George Knox (2021), "Platform Incentives and Commercial Music Production," expected by July 2022.

Open Access

All scientific publications that emerge from a grant from NWO should be freely accessible via Open Access from the moment these are published. This applies to scientific articles, books/monographs, chapters and conference papers.
For a more detailed explanation of NWO's Open Access policy, see: www.nwo.nl/en/open-science.

Are all publications available in Open Access form?	
☒	Yes
☐	no, because *Explanation*

Research data management

Have the data underlying the existing publications already been made available?	
☒	yes
☐	No None of the papers is published, and I will make available the data after publication. Notes: - Data for subproject 1 cannot be made public, as per a request by the data provider. - Data for subproject 2 has already been uploaded, but remains non-public - Data for subproject 3 already published

Verified by NWO - Publications and other forms of output

Follow-up actions (to be completed by NWO)

Completion

☒	I have completed this form and the required annexes truthfully and the knowledge institution and any consortium partners have been informed about the content.

For approval Project leader	Read Controller knowledge institution
Date: 17 augustus 2021	Date: 17 augustus 2021

Please proceed with the financial final report.

Follow-up actions by NWO

Date	Action	By	Status
Date			
Date			

Verification by NWO

Assessed by: *Name*	
Conclusion assessment, including motivation:	*Approve/Do not approve final report.*

Financial final report

File number:	451-17-028
Project title:	From Ownership to Access: The Implications of Streaming Digital Content on Consumers, Sellers, and Artists
Project leader:	H. Datta
Size of the grant:	250,000 EUR

Verification - to be filled out by NWO

Awarded grant exceeds k€ 125?	
☐	yes: Audit necessary ☐ Audit completed, date: *Date*
☐	no

Financial information

Describe the main aspects of the financial progress below. If applicable: list changes such as financial bottlenecks, depletion of credit and unexpected (dis)investments of more than € 10,000.

Budget module	NWO approved budget (allocation) and/or NWO amended budget	~~Expected~~ expenditure over the entire project duration	Difference budget - expected expenditure	Costs realised up to and including this period **21-05-2021** (provisional expenditure)
Personnel costs				
Material costs (Travel) 20% of material costs budget shift within material budget items				
Material costs (Other costs: Hosting workshop) 20% of material costs budget shift within material budget items				
Investments up to € 150,000	n/a	n/a	n/a	n/a
Investments € 150,000 up to and including € 500,000	n/a	n/a	n/a	n/a
Knowledge utilisation	n/a	n/a	n/a	n/a
Internationalisation	n/a	n/a	n/a	n/a
Money follows Cooperation	n/a	n/a	n/a	n/a

Budget module	NWO approved budget (allocation) and/or NWO amended budget	~~Expected~~ expenditure over the entire project duration	Difference budget - expected expenditure	Costs realised up to and including this period **21-05-2021** (provisional expenditure)
Project management	n/a	n/a	n/a	n/a

NB: You should request financial changes via your ISAAC account under the tab Requests for Change.

Verified by NWO

Does the column NWO approved budget match the grant?	☐ yes ☐ no: has a request for change been submitted?	*If no:* ☐ Request for change approved ☐ Action
Does the column expected expenditure match the grant?	☐ yes ☐ no: has a request for change been submitted?	*If no:* ☐ Request for change approved ☐ Action
Are the provisional and expected expenditure in line with the budget? No indications for overruns/changes between budget categories?	☐ yes ☐ no: has a request for change been submitted?	*If no:* ☐ Request for change approved ☐ Action

Partner contributions (total of all periods)

In cash contributions

Complete below form if you invoice consortium partners yourself.

☒ Not applicable

Name co-funder	NWO approved budget k€	Contributions received in k€	Contributions still to be received in k€

Verified by NWO

Does the contribution match the co-funding letter or partner agreement?	☐ yes ☐ no, has a request for change been submitted?	*If no:* ☐ Request for change approved ☐ Action
Have the amounts received been properly accounted for in the overview?	☐ yes ☐ no, contact the project leader	*If no:* ☐ Approved after contact with project leader
Have the amounts still to be received been properly accounted for in the overview?	☐ yes ☐ no, contact the project leader	*If no:* ☐ Approved after contact with project leader
Have the PPP Allowances been accounted for in accordance with the budget?	☐ yes ☐ no, has a request for change been submitted?	*If no:* ☐ Request for change approved ☐ Action
Have the PPP Allowances been accounted for in accordance with the conditions of the Ministry of Economic Affairs and Climate Policy?	☐ yes ☐ no, has a request for change been submitted?	*If no:* ☐ Request for change approved ☐ Action

In kind contributions

State which in kind contributions have been provided.

☐ Not applicable			
Name partner	NWO approved budget in k€	Contributions provided in k€	Contributions still to be provided in k€
Tilburg University (Contribution towards salary costs)			

Verified by NWO

Does the contribution match the co-funding letter or partner agreement?	☐ yes ☐ no, has a request for change been submitted?	*If no:* ☐ Request for change approved ☐ Action
Have the amounts received been properly accounted for in the overview?	☐ yes ☐ no, contact the project leader	*If no:* ☐ Approved after contact with project leader

Completion

☒	I have completed this form and the required annexes truthfully and the knowledge institution and any consortium partners have been informed about the content.

For approval Controller knowledge institution	Read Project leader
Date: 17 augustus 2021	*Date:* 17 augustus 2021

*Submit this report as a **Word document** via your ISAAC account under Projects/Tab Reports with subject "Final report".*

Follow-up actions - to be filled out by NWO

Date	Action	By	Status
Date			
Date			

Assessed by : *Name*	
Conclusion assessment, including motivation:	*Approve/Do not approve financial final report.*