Reorganised layers of highlights, in sequence per page

ARTWORK BY ELVIA VASCONCELOS. FROM THE ARTISTIC RESEARCH PROJECT "SKETCHES AS A CONVERSATION INTERFACE" CONDUCTED WHILE DOROTHEA SCHLEGEL ARTIST IN RESIDENCE AT THE CLUSTER OF EXCELLENCE "TEMPORAL COMMUNITIES: DOING LITERATURE IN A GLOBAL PERSPECTIVE", 2021.
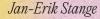
THE DATA PRACTITIONER AS AUTHOR: CONVERSATIONS WITH DATA

"We need to consider data as a raw material for creation, in the same way we consider language as the material to create fiction, or paper and graphite as a material to create designs."

Jan-Erik Stange

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Recently, when browsing through the collected volume *Critical Theory and Interaction Design*, I stumbled upon Melanie Feinberg's reading[1] of Wolfgang Iser's "Grasping a text" that he published in 1978. In this text the literary scholar explicates his Reader Response Theory. In contrast to other literary theories of interpretation Iser ascribes the reader an active role in the creative production of meaning. According to him, the reading process can be described as a "communication" and "dynamic interaction between text and reader".[2] In this perception the text merely "offers guidance as to what is to be produced, and therefore cannot itself be the product".[3] An essential quality of the text then is to leave certain things indetermined, in order for individual readers to fill in based on their own experience, thus creating the aesthetic object of literature as a result of the collaborative effort of author and reader.

Feinberg identifies three aspects she deems central to the theory and evaluates their applicability to Human Computer Interaction (HCI): the "Wandering Viewpoint", intersubjective comprehensibility, and reader agency. She specifically sees the value of those aspects in shedding light on the role of the materiality of software and how they shape the experience users have with it. Further, Feinberg sees these three aspects "as meaningful alternatives to traditional forms of inquiry in HCI that are more concerned with the actual effects of software on users (usability studies, for example), than the theoretical possibilities a particular software offers to potential users.

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1. Melanie Feinberg, Wolfgang Iser and the Reader as Creator, in: *Critical theory and interaction design*, ed. Jeffrey Bardzell, Shaowen Bardzell and Mark Blythe (Cambridge, MA 2018), pp. 253–269.

2. Wolfgang Iser, Grasping a text (1978), in: *Critical theory and interaction design*, ed. Jeffrey Bardzell, Shaowen Bardzell and Mark Blythe (Cambridge, MA 2018), pp. 227–252, here p. 227.

3. Ibid.

While Feinberg's deliberations on the value for HCI in general are valuable, I would like to ask more specifically what we could learn from Iser's theory for working with digital data in the digital humanities. What would an interface for data practice in this area need to look like?

Problems of existing software tools and their interfaces for representing data in the digital humanities have been discussed at great length. Only to name a few standpoints: Johanna Drucker has criticised the adoption of data visualisations from the sciences that, with visual representations, also bring in their "epistemological biases under a guise of familiarity".[4] Alexander Galloway argues that data visualisation is foremost a "visualization of the conversion rules themselves",[5] i.e., a representation of the contingent rules of translation that have been applied to bring data into any kind of form. Addressing visual representations in general, and to a lesser degree, raw data, Bruno Latour examines the role "immutable mobiles"[6] play in delivering data as somewhat fixated information by uncoupling it from the phenomena observed.

A lot more can be said about this topic. For this article, however, I would like to bring a new perspective into the discussion, based on a synthesis of Iser's Reader Response Theory with the Reflective Practice of philosopher Donald Schön. I will elaborate this in the following sections and apply it as a framework in a first design experiment.

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4. Johanna Drucker, Humanities approaches to graphical display. *Digital Humanities Quarterly* 5[1] (2011), pp. 1–21, here p. 1.

5. Alexander Galloway, *The Interface Effect* (Cambridge 2012), p. 83.

6. Bruno Latour, Visualization and cognition. Thinking with eyes and hands. *Knowledge and society* 6[6] (1986), pp. 1–40, here p. 7.

Because of the strong structural similarity, I would like to consider both theories in relation to each other and with respect to their value for data practice. According to Schön, Reflective Practice can be observed in many practice-based professions, among them design. In the context of design, he speaks of a "reflective conversation with the materials of a design situation",[7] or simply "conversation with the situation".[8]

Apart from the conversational aspect there are a couple of other similarities between the two theories. For example, they both describe a situation characterised by indeterminacy and ambiguity and the importance of earlier experiences that are reframed in the context of current situations. As a matter of fact, the similarity is striking. However, this is not surprising, considering both Iser and Schön are strongly influenced by the work of pragmatist John Dewey. I argue that both theories in conjunction open up new perspectives on working with data as a critical practice.

In the next two sections I would like to briefly introduce the two theories, followed by their comparison. Subsequently, the results of this comparison will serve as a foundation for developing a new perspective on working with data that takes the fictional qualities of it into consideration and lays out what an authorial data practice would entail. In the succeeding section I will elaborate further on how such a perspective would play out in the design of a digital environment for creating, structuring and transforming data and demonstrate this by means of a video mock-up. I will finish with a conclusion.

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7. Donald Schön, Designing as reflective conversation with the materials of a design situation. *Knowledge-based systems* 5[1] (1992), pp. 3–14.

8. Donald Schön, *The Reflective Practitioner* (New York 1983).

Wolfgang Iser's Reader Response Theory

In Iser's view, the "aesthetic object"[9] of literature is not the text itself, but the communication between reader and text, resulting in an "event".[10] In order for the reader to become this creative producer of an aesthetic object, a few conditions must be fulfilled. First and foremost, the text must be received in a sequential, linear fashion (which is usually the case when reading literature, especially in printed form). This leads to what Iser calls the "wandering viewpoint".[11] At any point during the reading process a reader can only grasp a small chunk of the whole text (Iser describes this chunk as having sentence length). Each new sentence is stored in memory and leads to certain expectations that usually are not fulfilled but rather modified by in turn new sentences, modifying the memory of it: "It is clear then, that throughout the reading process there is a continual interplay between modified expectations and transformed memories".[12] These unfulfilled expectations are, second, an important effect of another characteristic of the fictional text: An indeterminacy of the text that leaves room for the reader to develop specific expectations. Third, multiple sentences leave memories and create expectations that in their interplay Iser calls "perspectives." Perspectives can be that of figures, the narrator, the plot or the reader.[13] The reader has to bring these different perspectives into consistency: "…, the reader's position can only be established through a combination of these perspectives".[14] Fourth, this grouping,

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9. Iser, Grasping a text, p. 227.

10. Iser, Grasping a text, p. 243.

11. Iser, Grasping a text, p. 228.

12. Iser, Grasping a text, p. 231.

13. cf. Iser, Grasping a text.

14. Iser, Grasping a text, p. 233.

"consistency-building" or "gestalt groupings" by the reader, as Iser calls it, is an essential feature of the reading process for producing meaning. While through its structure the text suggests possible connections between textual perspectives, it is the reader's choice to connect perspectives, develop interpretations and create consistency. For different readers these choices may be different, depending on their individual experience and background. However, each interpretation and the associated gestalt groupings are characterised by a certain plausibility. What this means is that the selected gestalt groupings must be supported by the textual structure. Iser calls this "intersubjective comprehensibility".[15]

Donald Schön's Reflective Practice

In his book *The Reflective Practitioner* Donald Schön describes a situation in a design studio of an architecture school in which a student explains the problems she is facing with the task of developing a design concept for an elementary school to her teacher. In the following, Schön explains how teacher and student reframe the problem in a constant alternation between drawing and talking. Because of the uniqueness of such problematic situations, there is no standard solution, but a solution has to be developed in conjunction with defining the problem.[16] Schön calls this process a "reflective conversation with the situation".[17] According to him it is characterised by an iterative process of reframing problematic situations by drawing from earlier experience and applying it to current situations. In order to be able to adapt situations to a new

15. Feinberg, Wolfgang Iser and the Reader as Creator, p. 262.

16. cf. Schön, *The Reflective Practitioner*, p. 153.

17. Schön, *The Reflective Practitioner*.

frame, "experiments" or "moves"[18] are conducted, for example, by adding something to a sketch or changing a prototype, in general, by working with the material at hand. This often leads to "unintended consequences",[19] Schön calls it the "situation talking back",[20] which in turn urges the practitioner to reframe the situation once again, to conduct another experiment and so on. The consequences of these experiments are constantly judged based on "whether [the practitioners] can solve the problem they have set; whether they value what they get when they solve it […], whether they achieve in the situation a coherence of artifact and idea, a congruence with their fundamental theories and values, whether they can keep inquiry moving".[21] Based on these constant evaluations, decisions on how to proceed are made. Though these evaluations can appear as subjective, they receive their validity through their consistency with respect to the frame or the problem set by the practitioner. Schön explains this with regard to the judgements made by the student Petra: "[…] Petra's judgment is hers. It is, to this extent, a subjective judgement. Other designers might not agree with her. […] The point is, rather, that, as long as her judgments of significant scale are internally consistent, at least in this design episode, their 'subjectivity' is no obstacle to her designing."[22]

To be able to carry out this "conversation with the situation", it is essential that the situation is located in a "virtual world",[23] by which Schön not necessarily means virtuality as a digital phenomenon, but

18. Schön, *The Reflective Practitioner*, p. 155.

19. Schön, *The Reflective Practitioner*, p. 183.

20. cf. Schön, *The Reflective Practitioner*, p. 174.

21. Schön, *The Reflective Practitioner*, p. 166.

22. Schön, Designing as reflective conversation, p. 6.

23. Schön, *The Reflective Practitioner*, p. 185.

rather a "constructed representation of the real world of practice".[24] Such a representation affords a situation in which constraints present in the 'real world' are reduced, actions are immediate and reversible and variables that are dependent on each other in the 'real world' can be looked at separately in a sketch, for example.[25]

Reflective Practice and Reader Response Theory in comparison

Let's first turn our attention to the aspect of communication. In both theories there seems to be a conversation between a material and a person engaging with the material. In a Reflective Practice the back-talk (the material offering a new way to interpret it) is an unintended consequence as a result of an action. As described before, the process begins with reframing by drawing from earlier experiences. The practitioner adapts this frame to the situation and vice versa. While there are no actions in the Reader Response Theory, there is an equivalent to the unintended consequences in Reflective Practice. Iser explains this with the "Wandering Viewpoint", an effect of the sequentiality of the text. As sentences are read they will wander into memory and create expectations. When reading new sentences, expectations based on earlier sentences are often challenged, changing the memory associated with them. The reader experiences a moment of surprise, similar to the unintended consequence of Reflective Practice. Schön describes these processes as transactional: "The inquirer's relation to this situation is transactional. He shapes the situation, but in conversation with it, so that his own models and appreciations are also shaped by the situation."[26] So, a conversation is happening in both cases, but only in the case of Reflective Practice

24. ibid.

25. cf. Schön, *The Reflective Practitioner*, p. 186f.

26. Schön, *The Reflective Practitioner*, p. 177.

this is connected to changing the material of a situation. This makes sense, since Iser and Schön are concerned with different poles of interacting with aesthetic objects: Iser looks at the reception side, while Schön looks at the production side. Iser assumes that the structure (the text) is already there, Schön is also concerned with the way the structure (the design) is created.

A further trait shared by the two theories is the role played by indeterminacy and ambiguity. Iser explicitly states the importance of indeterminacies in the textual structure: "Since each sentence correlate aims at things to come, the prefigured horizon will offer a view which – however concrete it may be – must contain indeterminacies, and so arouse expectations as to the manner in which these are to be resolved."[27] With respect to the selections a reader makes and the possibilities he does not consider, Iser writes: "But these possibilities do not disappear; in principle they always remain present to cast their shadow over the gestalt that has relegated them."[28] Schön doesn't make explicit use of the words, but the process of framing he describes naturally involves indeterminacy and ambiguity. Schön explains: "The practice situation is often uncertain, in the sense that one doesn't know what the variables are. And the very act of experimenting is often risky."[29] As in Schön's example, sketches and other undetermined visual representations like prototypes play an important role in keeping the inquiry going. This is exemplified by Fish and Scrivener: "Therefore, when artists sketch, rather than draw, modification of the percept by mental manipulation is always involved. In other words, the visible marks made will

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27. Iser, Grasping a text, p. 230.

28. Iser, Grasping a text, p. 243.

29. Schön, *The Reflective Practitioner*, p. 170.

generate mental images that in turn may influence the sketch."[30] Fish
and Scrivener name both indeterminacy and ambiguity as central
characteristics of sketches that support this interplay. Sketches obtain
their particular quality through their analogue media (pencil on
paper, for example), which makes it easy to represent indeterminacy
and ambiguity by omitting parts, selectively emphasizing information
or hinting at different possible formal interpretations by overlaying
vague lines and shapes. Surprising findings can quickly and easily be
further explored by changing the sketch with a few pencil strokes,
thus keeping the inquiry going with minor effort. How such a
process can be supported in a digital environment remains an open
question. The example scenario at the end of the article explores
some pathways.

Another commonality between the theories is the importance
assigned to consistency-building. As already described in the two
preceding sections, readers as well as designers make decisions to
connect or group things that are subjective but comprehensible
for others because they align with a particular interpretation
or concept. The difference here again is that the reader builds
consistency solely in the mind, while the designer uses visual
representations to support himself or herself in the process. Iser
relates consistency-building to so-called "perspectives", which can
be those of figures, the narrator, the plot or the reader and which
the reader needs to bring into balance.

Lastly, both processes described in the theories happen in the virtual
and employ models of representations (in one case solely mental, in
the other visual) to create an aesthetic experience.

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30. Jonathan Fish and Stephen Scrivener, Amplifying the mind's eye. *Leonardo* 23[1] (1991), pp. 117–126.

In summary, both theories have in common the conversational aspect, indeterminacy and ambiguity of their subject-matter, the need for consistency-building and a degree of virtuality. However, in contrast to the Reader Response Theory, Reflective Practice is concerned with framing problems and developing solutions, and this is achieved through experiments and their evaluation. In this way, in Reflective Practice structure is created, not only "optimised".[31] While the sequentiality of the text, different perspectives and the "Wandering Viewpoint" enable the conversation with the text as described above, they also point beyond in that these three features also support fictionality in general. They usually are not present in Reflective Practice.

The data practitioner as author

In the digital humanities data is often the output of algorithms whose inner workings are either opaque to users because they operate in unpredictable ways (e.g., topic modelling) or they are developed within a research context with the intention to answer specific questions which might not be applicable to other areas. I propose to apply Reader Response Theory and Reflective Practice in conjunction, as a lens on data practice to serve as a framework for designing user interfaces that could enable a critical and conscious practice with data as material. By utilizing visual representations such interfaces would elevate scholars into a role as authors of their own datasets.

In order for this to happen we need to consider data as a raw material for creation, in the same way we consider language as the material to create fiction, or paper and graphite as a material to

31. cf. Iser, Grasping a text, p. 237.

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create designs. It seems natural to assume that data can be used as building material, since text already could be understood as a kind of "unstructured" (i.e., not tabular) data. However, tabular data, for example, is already very structured data. Is there enough flexibility to work creatively with such data, to shape it as a material? Yes, I would argue: Data rows can be rearranged in any way to group entries and relate them to each other without destroying the structure, new categories can be added to codify groupings, and data rows can be added and deleted at one's will. Rows and columns in such a dataset could even be created based on some calculation (this is something that software like Open Refine and Microsoft Excel already offers).

Another prerequisite for our authorial data practice is the possibility of conversing with data. For this, it would have to be possible to experiment with certain structures or configurations and evaluate them with respect to one's own research question. Such experiments would have to be carried out in a virtual surrounding, where changes made can be reversed again if the evaluation of an experiment comes to a negative conclusion. Virtuality seems to be a requirement that comes (almost) naturally with a digital user interface.

I suggest considering these structures as perspectives on the data, not in the way Wolfgang Iser describes it as a perspective of a certain persona but rather, in our case, as either a certain representation (raw data, table, visualisation, schematic view) or an arrangement or grouping of data. Both will be, to some degree, influenced by the source material of the data (for example the particular structure of a dramatic work), but are usually also the result of the actions performed by the data practitioner.

All these different perspectives data practitioners create are affordances for them to grasp the data and bring consistency into it.

However, similar to reading a text, the reception of these perspectives in sequence leaves gaps, indeterminacies and ambiguities, and these need to be filled to create a coherent and consistent view that relates to one's research question. In contrast to a reader, as authors data practitioners are not bound to the sequentiality of the material defined by someone else. They can decide on their own in which sequence they consider the different perspectives.

Working with the data as material, being able to create a multitude of perspectives to look at the data and, additionally, being able to decide for themselves in which order to consider it, data practitioners have ample scope to create structures. However, like Iser's reader, data practitioners cannot be fantasists, as they are not only bound by the structures they create and their research question(s) in turn, but more importantly, these structures are delimited by the raw material that served as source for them. Therefore, it is important to provide a perspective on the origin of the created data structure in the interface and allow data practitioners and others to evaluate the validity of any representation in the interface with respect to that source.

Usually, not only the source material for building the data will be of relevance, but also the contextual knowledge of data practitioners creating different perspectives. The interface should provide means to add this knowledge in a coded form applicable to the structure of the data. To enable a conversation, data structures should be represented visually in a graphical user interface (GUI) that allows direct manipulation and instant evaluation of the effects of one's actions, thus keeping the inquiry evolving this way. In the next section I would like to demonstrate some traits such an interface would need to exhibit.

Proposal: Creating a table from a text file with regular expressions

We will look at a simple example of a user interface that would allow data practitioners to create a structured dataset from a semi-structured text file with the help of regular expressions. The interface would consist of a text field containing an uploaded or pasted text, a visual editor for creating and combining regular expressions [32], an area for creating a data table from the data generated by the regular expressions and a canvas for data visualisation based on the tabular data. All these different views are connected with each other as so-called "linked views"[33] that change accordingly when one of the other views is changed.

The text used in the example is a PDF file with a list of the diplomas of the famous German design school Hochschule für Gestaltung Ulm that existed from 1953 to 1968.[34] Considered as Bauhaus successor, the private school had a lasting effect on design education in Germany and other countries in the world and many of its graduates have shaped design education and design theory and continue to do so until today. From the end of the 1950s until the beginning of the 1960s a dispute among the faculty members of the school about the educational orientation emerged and became a problem that threatened the survival of the institution. One group advocated for a stronger reliance on scientific methodology for the design education, while the other group wanted to maintain an educational model that was strongly influenced by Bauhaus methods.
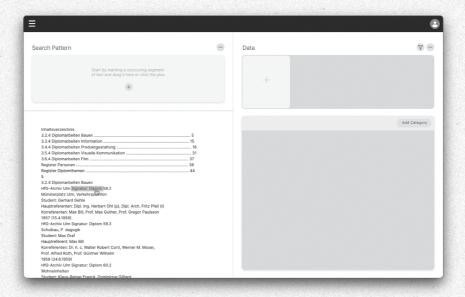
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32. A term that originated in computer science describing a sequence of characters (a pattern) in a particular syntax to match text strings.
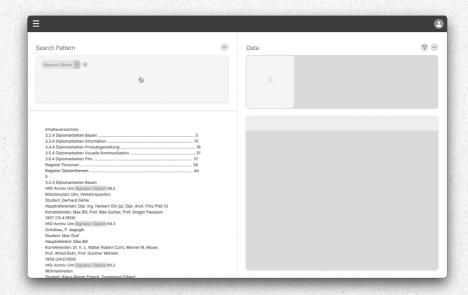
33. Andreas Buja, John Alan McDonald, John Michalak and Werner Stuetzle, Interactive data visualization using focusing and linking. *Proceedings of the 2nd conference on visualization (VIS '91). IEEE Computer Society Press* (1991), pp. 156–163.
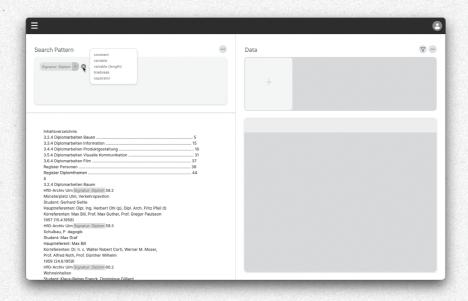
34. https://hfg-archiv.museumulm.de/wp-content/uploads/2019/01/f_06_diplome.pdf, access: July 2, 2024, 5:16pm.
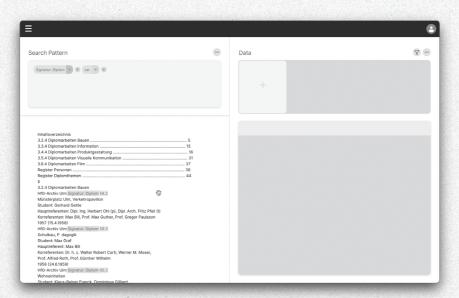
In our example scenario, a data practitioner wants to investigate how many diploma theses the members of the respective groups supervised, what the topics were, and who acted as co-supervisors. The scholar is interested in patterns in the data which hint at social networks within the group as well as between groups that haven't been part of research. A short video prototype demonstrates how she would go about creating a structured dataset from the text, adding further data she draws from her own knowledge about the institution.
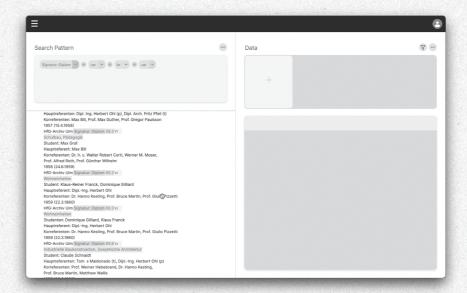
The video consists of five sequences in which the scholar continuously changes perspectives on the data. In the first sequence we can see the text being loaded and the practitioner starting to build the search pattern. For this, she highlights text that she wants to use as an anchor for her pattern and drags it into the search pattern panel above the text. The selected string "Signatur: Diplom" is now automatically identified as a constant that each match in the text has to start with. As soon as the scholar has dragged the string into the panel, we can already see the matches in the text highlighted in a light red color, giving her an additional perspective on the source text that helps her to see the distribution, spot gaps, etc. Step by step she now adds elements to the search pattern to match the following entries in the text: A variable to match the IDs of the diploma theses, a line break and another variable to match the title.

Sequence 1

Sequence 1

Search Pattern

constant
variable
variable (length)
linebreak
separator

Signatur: Diplom

Data

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3.2.4 Diplomarbeiten Bauen
HfG-Archiv Ulm Signatur: Diplom 58.2
Münsterplatz Ulm, Verkehrspavillon
Student: Gerhard Gehle
Hauptreferenten: Dipl. Ing. Herbert Ohl (p), Dipl. Arch. Fritz Pfeil (t)
Korreferenten: Max Bill, Prof. Max Guther, Prof. Gregor Paulsson
1957 (15.4.1958)
HfG-Archiv Ulm Signatur: Diplom 59.3
Schulbau, P dagogik
Student: Max Graf
Hauptreferent: Max Bill
Korreferenten: Dr. h. c. Walter Robert Corti, Werner M. Moser,
Prof. Alfred Roth, Prof. Günther Wilhelm
1958 (24.6.1959)
HfG-Archiv Ulm Signatur: Diplom 60.2
Wohneinheiten
Student: Klaus-Reiner Franck, Dominique Gilliard

Search Pattern

Signatur: Diplom   var

Data

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Wohneinheiten
Student: Klaus-Reiner Franck, Dominique Gilliard
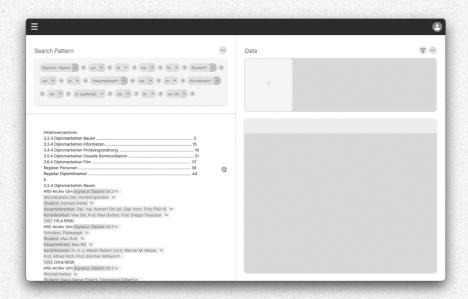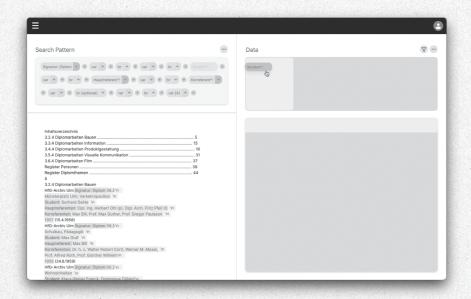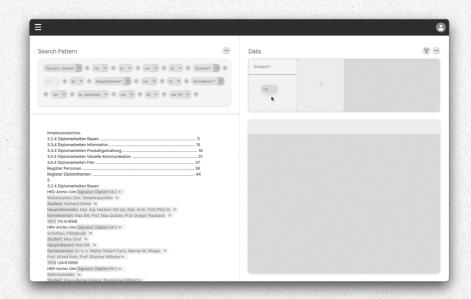
Sequence 1

Sequence 1: Building the search pattern (Screenshots of video prototype; designed by the author).

In the following sequence (Sequence 2) we can see that she has added many more elements to match the data in the lines below and collects all the information relevant for the dataset she wants to create. She has added elements to match the students' names, the primary and secondary supervisors' names and the dates of the theses. She is ready to build the dataset and drags the constant "Student*:" to the data table area on the right side of the interface to use it as a column header. After that she drags the subsequent variable (the students' name) in the search pattern underneath the column header area to use the names as values. The column is instantly populated with the names of the design students. Now the scholar is looking at another perspective, the list of names in this column. The entries in this column are also represented by horizontal lines in the visualisation panel, providing her with a visual perspective.
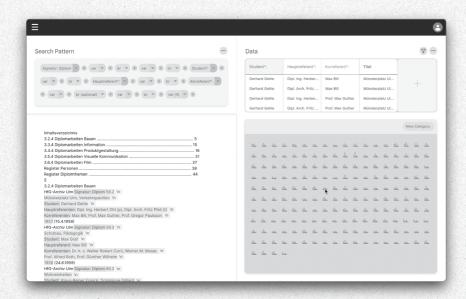
Sequence 2

Sequence 2

Sequence 2

Sequence 2: Building the dataset

In the third sequence she has added three more columns for the primary and secondary supervisors as well as the title. An individual colour has been automatically assigned to each column. This colour is also used in the data visualisation below, where the currently selected column ("Student*:") is shown as a horizontal line and the number of unique values associated with it in the other columns are shown with small bars on top. For now, all these bars have the same length of 1 because the primary and secondary supervisors have not been split up into individual data rows. To do this, the scholar selects the option "Split cells…" from the option menu and chooses to split all cells with values containing commas, leading to a data transformation that affords different grouping possibilities and with it, new perspectives, as we will see. By confirming the splitting, each cell with comma-separated values is split up into rows, so that each combination of student, primary and secondary supervisor is now translated into an

extra row. This also has an effect on the data visualisation, insofar as the bars now show for each student the number of primary and secondary supervisors that mentored the thesis. The length of the title ("Titel") naturally stays at 1 because there is only one title corresponding to each student. The small bar charts in the data visualisation thus offer a new overview perspective on the number of supervisors connected to the individual theses.
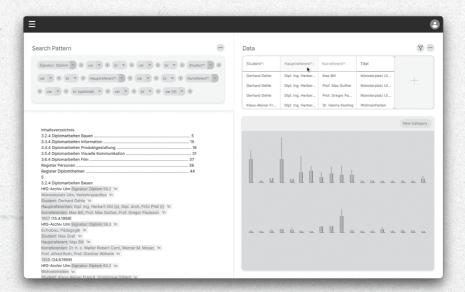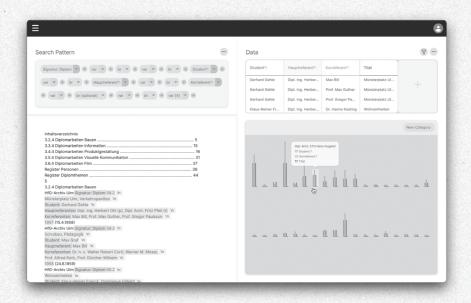
Sequence 3

Sequence 3

Sequence 3: Transforming the dataset

For the scholar, however, another perspective would be more helpful. She is rather interested in the number of students the different supervisors have mentored. For this, she selects the primary supervisor column ("Hauptreferent*:") in the fourth sequence of the video. Clicking the column header immediately entails the perspectival change in the data visualisation, resulting in a change of the number of elements on the canvas: Now there is a bar chart for each primary supervisor that, through its bars, represents the number of associated students (pink), secondary supervisors (orange) and titles (purple).

Next, the sequence shows her hovering over an element and reading a detailed info pop-up of this element. She decides to select it. This leads to highlights in the source text on the left side, marking every occasion of this supervisor ("Dipl. Arch. ETH Hans Gugelot") in the text, presenting a new perspective overlaying the old text perspective. These highlights can now be explored in more detail in the context of the surrounding text.
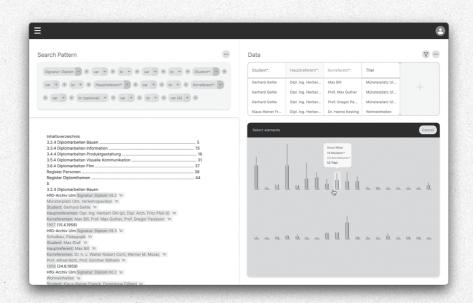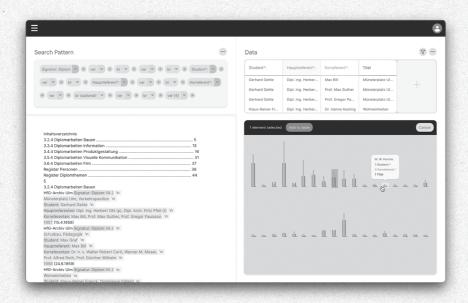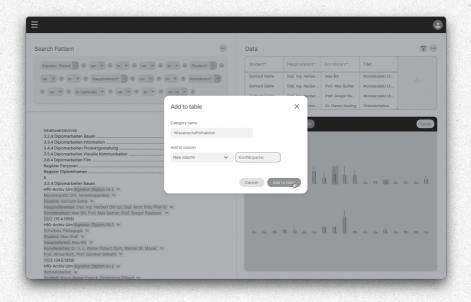
Sequence 4

Sequence 4

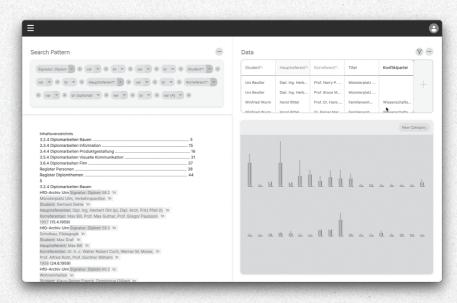Sequence 4: Changing the visualization

Finally, in the last sequence, she enters a mode to add data to the table and begins with selecting two supervisors she immediately recognises as belonging to the group of professors advocating for a stronger reliance on scientific methods. She defines a new category, "Wissenschaftsfraktion" [science faction] for them, for which she also creates a new column, "Konfliktpartei" [conflict party].

Sequence 5

Sequence 5

Sequence 5

Sequence 5: Extending the dataset

The video ends here, but we can imagine that she will go on investigating different members of the staff, assign group affiliation based on what she already knows or based on research conducted for this project. For this she will continue to look at the data from different angles, trying to find answers for the questions raised by the gaps between the perspectives.

Conclusion

In this article I proposed a synthesis of two approaches, Reader Response Theory and Reflective Practice. By combining the experimental action-based aspect of Reflective Practice with the fictional aspect of Reader Response Theory, my aim was to create a foundation for developing interfaces in which data practitioners would become authors of their own datasets. Such interfaces would ideally support them in developing and maintaining a critical attitude to the material they are working with.

For this to be successful, I identified a few conditions that would need to be met: Data needs to be considered as a material we can creatively work with, a material that, by applying structure to it, "talks back". This means that we need to be able to experiment with the material and reverse actions when we realise that they did not lead us anywhere. Applying structure to data can usually happen in two ways. Either by arranging or grouping it in a particular way, or by representing it in different ways with tables, text, visualisation etc. I suggest calling these structures "perspectives", borrowing terminology from Iser. Such perspectives would also create the conditions for a "Wandering Viewpoint", but in contrast to Reader Response Theory these perspectives would not need to be in a sequential order.

These perspectives have a common goal: In their combination they contribute to telling stories about the data that respond to the research question. How well they respond depends on how well the practitioner is able to connect them, to fill the gaps between them and to build a consistent network of perspectives with respect to the research question.

This not only hinges on the competence of the practitioner to develop a consistent narrative, but on the material he or she chooses to work with. That is why, I would argue, it is important to keep the connection to the source material through the interface intact.

The scenario I presented is a simple and rather specific one: creating a dataset from a text file with the help of regular expressions. However, I argue, as a first experiment it is suitable to demonstrate, what work with a user interface for data authoring could look like and justify further investigation.

The demo video shows that data can indeed be used as a material that can be shaped, that talks back and presents "unintended consequences". For example, this is apparent in the change of elements in the visualisation as a reaction to selecting a different column or the highlighting of text while adding elements to the search pattern. Furthermore, the variety of different perspectives and the ability to switch between them seems to be a good basis to understand relations within the dataset and add additional data relevant to the research question.

However, more work is necessary to investigate what constitutes perspectives and how they can be arranged in the interface: How would the interface change when working with other data and other scholarly scenarios? What other perspectives could be helpful? What

other data visualisations could be helpful? And can we even speak of the emergence of data fiction in such environments? It would probably be helpful to look at a particular example of how a scholar would develop a narrative by considering several data perspectives and eventually decide on a particular combination and ways of filling the gaps between the perspectives, i.e., interpreting the interplay of the perspectives.

Furthermore, there might be better alternatives to building and forming the dataset than proposed in the video. For this, different interaction design techniques will have to be explored. For example, we saw one way of bringing in contextual knowledge (defining new data dimensions and categories) demonstrated in the video. In many cases, however, observations and conclusions in textual form will have to be recorded as well.

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‹END›

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