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# Interfacing Collaborative and Multiple-Layered Spaces of Interpretation in Humanities Research. The Case of Semantically-Enhanced Objective Hermeneutics

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## Introduction

In recent years, semantically enhanced Digital Humanities Research has become a widespread topic realized in different environments (e.g. CWRC, Pundit). While semantic graph technologies are mainly used to connect, annotate, query and aggregate strictly formalized entities, there is a lack of interfaces for enhancing acts of interpretations.

Annotations are described as crucial in interpretations and are designated as a killer application (Juola, 2009), scholarly primitive (Unsworth, 2000) and considered as notetaking within main scholarly information activities (Palmer, et al. 2009). Concerning an interpretational act, limitations of annotations are identified (overlapping, flexibility), and there is a demand for customization to the research context and an iterative and agile of schema development (Piez, 2010). Drucker indicates the emergent qualities of interpretation, while suggesting an interface which “supports acts of interpretation rather than simply returning selected results from a pre-existing data set” (Drucker, 2013: 37). In this paper, this desideratum is addressed by designing an interface for collaborative and multi-layered spaces of interpretations based on a

semantic graph (Suchman, 2007; Drucker, 2011; Rheinberger, 2010; Barad, 2003).

A specific style of interpretation is chosen as a case study, i.e. collaborative analysis of face-to-face situations in small groups by creating a multiple layered space of interpretation - Objective Hermeneutics. In German-speaking countries, the approach of Objective Hermeneutics is one of the main methodologies used for qualitative analysis (Flick, 2005), which generates deep-structure analyses of cases by reconstructing actions and meanings. Creation of an interface that enables semantic annotations for these acts of interpretations makes it possible to elaborate and explicate a multiple layered space of interpretation.

In the following, we describe settings in the interpretational act of Objective Hermeneutics. Furthermore, the background of the design is outlined in relation to methods, design and data. The main contribution is twofold: (i) realization of an interface focusing the semantic enhancement of the collaborative spaces of interpretation and accountability and (ii) examines the semantic explication of the research data (interactional protocols), the interlinked multiple layered annotations and the possibility to retrace the space of interpretation.

## The collaborative interpretational act of Objective Hermeneutics

The theoretical framework of Objective Hermeneutics is based on Oervermann's theory of professionalization (see Reichertz, 2004), whereby the act of interpretation follows strict principles for analyzing ‘natural protocols’ of social practices (transcripts). In a sequential multi-step procedure of interpretation, the structure of the case is reconstructed. The act of interpretation is realized in small groups where a common space of imagination is created collaboratively, wherein multiple layers of interpretations interfere and make use of falsification and abduction (Flick, 2005). Accordingly, the process of interpretation can be outlined as follows: 1) Specifying research question and analytical framework; 2) choosing appropriate transcript; 3) selecting sequence from interaction protocol (transcript); 4) creating and discussing step by step multiple corresponding stories, perspectives, and connections of the sequence; 5) recontextualisation to the concrete case, whereby in the long run hypotheses of the structure of the case are created iteratively and new sequences are selected (back to 3.). Additionally, 6) a proofing process is started (falsification). Based on this interpretative act, a detailed case structure is created which describes the conflicting motivations, interests and interactions of the actors. While in recent

years special research data archives for archiving and re-using the transcripts (non-processable PDFs) have been established, the act of interpretation itself is still paper-based. This situation provides the opportunity for an appropriate case study for designing an interface for collaborative and multi-layered spaces of interpretations (for example, see the archive for pedagogical casuistry (ApaeK) archiving transcripts of classroom interactions)

### Methods, design, and data

The research environment for Objective Hermeneutics is based on a participatory design and agile development approach, using [Semantic MediaWiki](#) framework. To fulfill the case-related special research requirements an extension for Semantic MediaWiki and a research ontology were collaboratively developed. Besides the analysis of needs and requirements (site visit, artefact analysis) rapid prototyping was used and three versions of the environment were thoroughly tested (the logfile analysis between the last two versions indicates a clear improvement at the interpretation process by reducing the break up rate from 33% to 0%). A group of distributed researchers across Germany and interested in classroom interactions (topic othering) used the environment in practice over several months and supported the design process by attending meetings and giving feedback.

### Interfacing collaborative spaces of interpretations and accountability

#### Explicating interaction protocols semantically

The act of interpretation in Objective Hermeneutics is based on 'natural protocols' of social practice, which pursue strict notation guidelines for the transcription process (e.g. anonymization, settings of actors, properties like loudness). The transcript is enriched with contextual metadata (e.g. collecting context, duration, and topic). Line by line, each speech act of an actor and relevant interactions are described in detail (based on audio recordings, maps, photographs). This initial base already allows for semantically enhancing the space of interpretation: Interlinking relevant documents, entities, properties, and relations for semantic browsing (Figure 1, 1+2). Additionally, a formula semantically (Figure 1, 3+4) outlines the interactions of the transcript in detail (actor, speech act/interaction, line number). Thus, each annotation of interpretation can be related to this empirical level and the process

of interpretation can be retraced. Based on this semantically enhanced transcript, the researchers choose and define their sequence of interest to start their act of interpretation (segment selection).

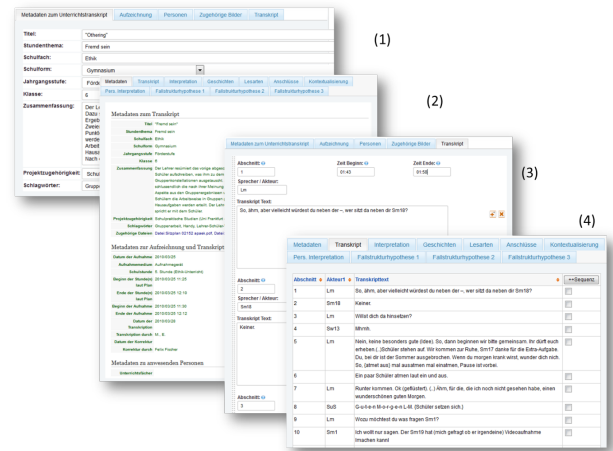


Figure 1. Metadata of transcript (1, 2) and semantic interactions (3, 4)

### Interlinking spaces of interpretation and multiple layered annotations

The act of interpretation in Objective Hermeneutics is semantically-enhanced and explicated by following guidelines for interpretation, whereby the flexibility of interpretation and the computer-mediated co-presence is taken into account. Each selected sequence of the transcript opens up the space of interpretation through multiple layered styles of annotations (stories, perspectives, connections, and contextualization) (Figure 2, 2+3). Subject to their discussions and notes, the researchers specify their arguments and elaborate a common ground for the case analysis. For an adequate interface of the phenomenon, the multiple layered styles of annotations need to be visualized in relation to the corresponding sequence of the transcript (compare Figure 2, 1+3). Closure respectively densification of the space of interpretation is semantically enhanced by creating specific case hypotheses. Researchers create connections between the layered annotations and specific case hypotheses, whereby a hypothesis and its related entities (e.g. layer of annotation, sequence, interaction, actor, or author) can be browsed semantically, described with texts and data representations. Each annotation is described with further relevant properties (e.g. timestamp, researcher name, related sequence) and interlinked within the semantic graph.

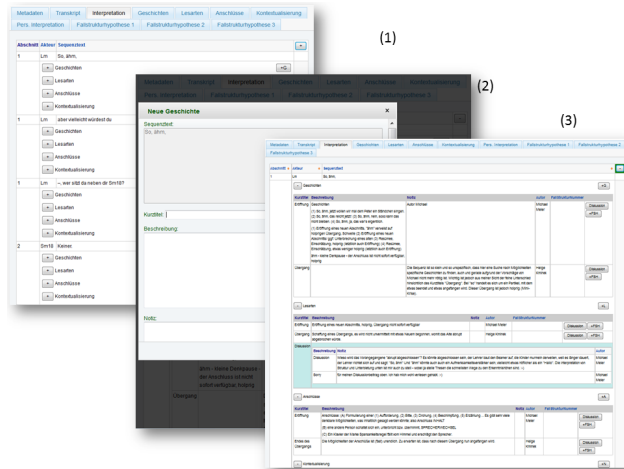


Figure 2. Selected sequences (1), annotation creation (2), and multiple layered annotations and discussions (3)

### Retracing the spaces of interpretation and accountability

The analysis and reflection of the research process as well as the spaces of interpretation are enhanced by using a semantic graph and explicating the interaction protocols (transcripts) offering new capacities for retracing the spaces of interpretations (Figure 3). The multiple layered semantic graph interlinks the acts of interpretation and facilitates multiple perspectives for accountability concerning the 1) interaction protocols and their interlinking (Figure 4, 2), 2) the chronological acts of the researchers, 3) the multiple layered annotations for interpretations (Figure 4, 1), and 4) the creation and interlinking of the case hypothesis. Besides these imminent possibilities of the research project, external aspects of accountability can be addressed. While in Humanities the practice of data citations is not widely spread, research communities in Object Hermeneutics have established a citation practice via the archives of the transcripts, referring to the interactions of the transcript in their publications (as bibliographic data). In retracing the spaces of interpretation, the relevant multiple layers of annotations as well as the hypothesis interlinking can be referenced, opened, and described with semantic vocabularies. The semantic graph has been mapped to relevant semantic vocabularies e.g. Wf4Ever Research Object Model (ro), Object Reuse and Exchange (ore), Named Graphs (rdg), Web Annotation Data Model.

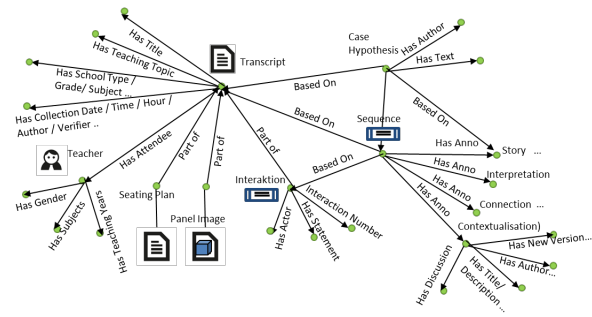


Figure 3. Visualization of semantic graph with traceable entities

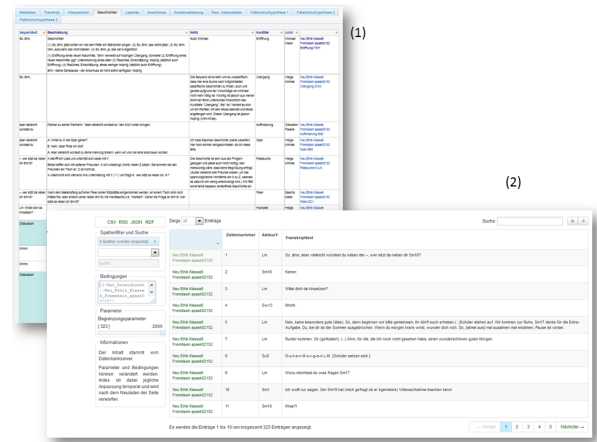


Figure 4. Annotation layer of stories (1) and interactive datatable of interactions (2)

### Discussion and outlook

In this paper, we discussed and demonstrated the design of an interface for collaborative and multi-layered spaces of interpretation, using the methodological approach of 'Objective Hermeneutics' as a case study. The interface is considered in relation to the phenomenon and the relevant performative material-discursive capacities for the interpretational act, focusing on the use of a semantic graph. The detailed semantic description of the research data (transcripts) and the associated spaces of interpretations (stories, perspectives, connections, and contextualisations along with hypothesis) enable a collaborative and distributed analysis and new ways of retracing the spaces of interpretation (interlinked data, chronological acts, multiple layered annotations, case hypothesis). But time and effort of the semantic enhancement need to be balanced against these added values in each new research project (e.g. interlinking, accountability, data manipulation, visualisation, citation, and openness).

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## Bibliography

- Barad, K.** (2003). "Posthumanist performativity: Toward an understanding of how matter comes to matter." *Signs*, 28(3), 801-831.
- Drucker, J.** (2013). "Performative Materiality and Theoretical Approaches to Interface." *digital humanities quarterly*. 7 (1). <http://www.digitalhumanities.org/dhq/vol/7/1/000143/000143.html>
- Drucker, J.** (2011). "Humanities approaches to interface theory." *Culture Machine*. 12(0). 1-20.
- Flick, U.** (2005). "Qualitative Research in Sociology in Germany and the US—State of the Art, Differences and Developments." *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 6(3). <http://www.qualitative-research.net/index.php/fqs/article/view/17>
- Juola, P.** (2008). "Killer Applications in Digital Humanities." *Literary and Linguistic Computing*, 23(1), 73-83. <https://doi.org/10.1093/lc/fqm042>
- Palmer, C. L., Tefteau, L. C., Pirmann, C. M.** (2009). "Scholarly information practices in the online environment." Report commissioned by OCLC Research. <http://www.oclc.org/programs/publications/reports/2009-02.pdf>.
- Piez, W.** (2010). "Towards hermeneutic markup: an architectural outline." *Digital Humanities 2010: Conference Abstracts*. <http://dh2010.cch.kcl.ac.uk/academic-programme/abstracts/papers/pdf/ab-743.pdf>
- Reichertz, J.** (2004). "Objective Hermeneutics and Hermeneutic Sociology of Knowledge." U. Flick, E. v. Kardoff, I. Steinke (eds.), *A Companion to Qualitative Research*. 290-295. London.
- Rheinberger, H.-J.** (2010). *An epistemology of the concrete: Twentieth-century histories of life*. Duke University Press.
- Suchman, L.** (2007). "Human-machine reconfigurations: Plans and situated actions." Cambridge, University Press.
- Unsworth, J.** (2000). "Scholarly primitives: What methods do humanities researchers have in common, and how might our tools reflect this." *Symposium on Humanities Computing: Formal Methods, Experimental Practice*. King's College, London.