Syracuse University
SURFACE

iSchool Faculty Scholarship | School of Information Studies (iSchool)

1-1-2007

Understanding Virtuality: Contributions from Goffman's "Frame Analysis"

JoAnn Brooks
Syracuse University, jbrook03@syr.edu

Follow this and additional works at: http://surface.syr.edu/istpub

Part of the Information and Library Science Commons, Organizational Communication Commons, Other Social and Behavioral Sciences Commons, Science and Technology Studies Commons, Social Psychology and Interaction Commons, and the Sociology of Culture Commons

Recommended Citation
Brooks, JoAnn, "Understanding Virtuality: Contributions from Goffman's "Frame Analysis"" (2007). *iSchool Faculty Scholarship*. Paper 87.
http://surface.syr.edu/istpub/87

This Book Chapter is brought to you for free and open access by the School of Information Studies (iSchool) at SURFACE. It has been accepted for inclusion in iSchool Faculty Scholarship by an authorized administrator of SURFACE. For more information, please contact surface@syr.edu.

Chapter in *Virtuality and Virtualization*. Crowston, K., S. Sieber and E. Wynn, Eds. Springer 2007.

Understanding Virtuality: Contributions from Goffman's *Frame Analysis*

JoAnn M. Brooks
The MITRE Corporation
202 Burlington Rd.
Bedford, MA 01730
jbrooks@mitre.org

Abstract. Virtual interactions are normally assumed to be separate and distinct from the "real world," yet they are also situated within material reality. In this paper I propose that a situated approach to understanding virtuality can be developed through drawing from Goffman's *Frame Analysis* (1974/1986). I explain how Goffman's terminology and concepts afford a way of integrating the study of virtual interaction with the study of social interaction more generally. His frame analysis approach offers constructs useful for distinguishing virtual worlds from each other and from real worlds in a way that is consonant with perspectives on human-computer interaction. His language can help to account for the phenomenon of immersion in virtual worlds; and it is well suited for understanding co-present and mediated social interaction at the same time. I conclude by discussing some limitations of this approach and suggesting directions for further research.

1 Introduction

RW, an acronym for the 'Real World' commonly used inside virtual spaces to refer to the non-virtual world, implies that the material world is separate and distinct from virtual worlds. Yet people engaged in virtual action, whether virtual work, online games, or simply electronic communication, are *situated in* the real world and using material technology. The importance of the local and the "real" relative to virtuality has been stressed by Woolgar in his chapter on "rules of virtuality" [1].[1] Such a

[1] Four of Woolgar's [1] five rules reference "real" or "local" (emphases added):
(1) The uptake and use of the new technologies depend crucially on *local* social context.
(3) Virtual technologies supplement rather than substitute for *real* activities.
(4) The more virtual the more *real*.
(5) The more global the more *local*.

local, material perspective is consistent with the tradition of situated approaches to the use of information and communication technology (ICT)–stretching back at least as far as Suchman's *Plans and Situated Action* [2].

Virtual activity is normally grounded in real-world actions such as tapping fingers on a keyboard, directing gaze at a monitor, and moving a computer mouse (or other physical control). While rarified forms of virtual experience such as 'virtual reality caves' are becoming outnumbered by situated instances of virtual teams, virtual organizations, and virtual workplaces for business; virtual spaces and interactions are becoming even more tightly integrated with the "real world."

Although virtual action is situated at least partially in the local, material world, it is clear that something else (i.e. something 'virtual') is also going on. Users interact with technology acting *as if* distant or abstract resources are local. The question from a situated perspective then is, "How is it that participants situated in a local material environment are able to think and act as if they're working in a team or organization or other simulation with others who are not physically co-located?" More succinctly the question might be, "How do people understand what is virtually going on in their virtual environments?"

Phenomenological approaches applied to virtuality, such as Heidegger's [3] "ready-to-hand" and "present-at-hand" and Polanyi's [4] proximal and distal aspects of the tacit dimension can explain individual experience but remain essentially individualistic and offer little explanation of the interface between virtual activity and situated social interaction.

In this paper, I propose that socially situated aspects of virtuality can be understood and explained using Erving Goffman's *Frame Analysis*: *An Essay on the Organization of Experience* [5] in a way that supports a broader understanding of the relation between virtuality and social interaction. Much of Goffman's research examines situated interaction – how people interact with each other in co-present situations. And since virtual experience entails situated action – including human-computer interaction and mediated social interaction – Goffman's work on situated social interaction seems a promising place to start shedding light on situated aspects of virtual/mediated social interaction.

Frame Analysis is one of Goffman's most relevant works for understanding virtuality because it readily addresses 'frames of reference' more generally. Such perspectives are well developed in social science (where they are often referred to as "interpretive frames") and are reflected in the information systems literature at least as far back as Orlikowski & Gash's [6] work on "technological frames." Orlikowski & Gash provide an extensive review of the socio-cognitive literature on frames and define technological frame as "a core set of assumptions, expectations, and knowledge of technology collectively held by a group or community" [6, p. 199]. They also note how 'congruence', or alignment of frames on key elements across stakeholders, is correlated with shared expectations across these same groups.

Goffman's *Frame Analysis* is therefore relevant to understanding virtuality because he uses a situated perspective, because he is concerned with interaction – especially social interaction, and because frames are a convenient way of understanding virtual perspectives. I start with an overview of Goffman's [5] work on *frames* and demonstrate how several important aspects of virtuality can be well-accounted-for by his approach: the non-virtual "Real World," the meaning of simulated images and processes, immersion in simulated images and processes, and

virtual social interaction. I then discuss how this approach fits in with a larger perspective on virtuality, and conclude with suggestions for further research.

2 Goffman's *Frame Analysis*

In *Frame Analysis*, Goffman sets out a bold and ambitious agenda, "My aim is to try to isolate some of the basic frameworks of understanding available in our society for making sense out of events and to analyze the special vulnerabilities to which these frames of reference are subject" (10).[2] The phrase 'framework of understanding' refers to psychological schemata of interpretation that an individual brings to a situation, based on prior experience/learning that normally enable the individual to come to terms with that situation. It also refers to the way that people understand and describe *what it is that is going on* in social interaction (8).

Goffman posits that in any human, and especially social, activity, a correspondence exists between the organization of the activity and how that activity is perceived (the current frame of understanding).[3] For this, he draws from the work of Gregory Bateson [7] highlighting the role of psychological frames in perception and linking them to Gestalt psychology. Bateson notes:

> Psychological frames are exclusive….[and] inclusive. From the point of view of set theory these two functions are synonymous, but from the point of view of psychology it is necessary to list them separately. The frame around a picture, if we consider this frame as a message intended to order or organize the perception of the viewer, says, 'Attend to what is within and do not attend to what is outside.' Figure and ground, as these terms are used by Gestalt psychologists, are not symmetrically related as are the set and nonset of set theory. Perception of the ground must be positively inhibited and perception of the figure (in this case the picture) must be positively enhanced. [7, p.187]

In other words, perception highlights some aspects of an activity while it de-emphasizes or even ignores others. Bateson also notes that psychological frames are related to "premises" that tell the viewer what kind of thinking to use; where *premise* "denote[s] a dependency of one idea or message upon another" [7, p. 186].[4]

Building on Bateson's concept of frame and his identification of premises as dependencies, Goffman posits that at any single moment one set of correspondences informs perception and other possible mappings do not. This despite "the fact that there are likely to be many valid principles of organization that could but don't inform perception" (26). He refers to the specific correspondences or dependencies in effect as *organizational premises*. These organizational premises, or "principles of organization which govern events – at least social ones – and our subjective

[2] Page numbers without references are to Goffman's *Frame Analysis* [5].

[3] Whether the correspondence is "accurate" or not is another matter; suffice it for now to consider that *some* correspondence exists. The possibility of totally random perception and activity is unlikely enough in most work environments.

[4] Bateson notes "that the 'premise' relation in psychology is likely to be intransitive" [7: p. 186]: i.e. the coexistence of dependencies between A and B, and between B and C, does not necessarily imply dependency between A and C.

involvement in them" constitute Goffman's definition of the "frame" of an activity (10-11).[5] He notes that these organizational premises are "sustained both in the mind and in activity" and something that human cognition "arrives at, not something cognition creates or generates" (247). [6]

Following Goffman therefore, we can understand the 'frame' of an activity as the set of correspondences between the organization of the activity and the organization of the framework of understanding, as portrayed in Figure 1.

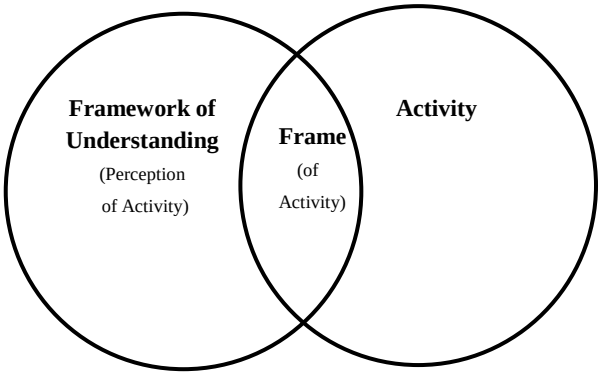

Figure 1. Relationship between Framework of Understanding, Frame, and Activity

In other words:

- A *framework of understanding* (interpretive frame) shapes the meaning of an activity or event, enabling description of it, and informing / regulating the person's activity.

- A *frame* is comprised of the *organizational premises* (dependencies) between the organization of activity or an event, and the organization of subjective experience.

Having clarified these differences, Goffman proceeds to employ 'frame' as synonymous with 'framework of understanding' elsewhere in his book; nevertheless, the distinction appears useful and I retain it.

[5] Although in at least one case he hedges slightly, stating "frame is the word I use to refer to such of these basic elements *as I am able to identify*. That is my definition of frame" (11; emphasis added).

[6] "It has been argued that a strip of activity will be perceived by its participants in terms of the rules or premises of a primary framework. These frameworks are not merely a matter of mind but correspond in some sense to the way in which an aspect of the activity itself is organized – especially activity directly involving social agents. Organizational premises [dependencies] are involved, and these are something cognition arrives at, not something cognition creates or generates. Given their understanding of what it is that is going on, individuals fit their actions to this understanding and ordinarily find that the ongoing world supports this fitting. These organizational premises – sustained both in the mind and in activity – I call the frame of the activity." (247)

In a simple case of virtuality such as 'flying' a flight simulator then, Goffman's concept 'frame' highlights the visual perception of what is displayed on the screen and de-emphasizes perception of other bodily movements including (and perhaps especially) manipulating controls. In this example, the organizational premises are the correlations (resemblances) between aspects of the visual display and subjective experiences associated with real world geographic terrain and airspace.

3 The Non-Virtual "Real World"

The term "virtuality" has meaning only in contrast to that which is non-virtual; as Giddens [8] notes, technologically-mediated relationships presuppose familiarity with co-present relationships. It therefore must be possible to describe the material world and co-present interaction in a grounded and situated way that still enables distinctions between virtual worlds and the real world. To ground the ensuing discussion of virtuality, I next focus on how Goffman's *Frame Analysis* approach can be used to describe "real world" (non-virtual) frames of reference relative to virtual reality.

While innumerable frameworks or interpretive frames can exist for understanding any set of events, Goffman distinguishes "primary frameworks" as the interpretive schemata that people rely on for understanding what is "really" going on: "Actions framed entirely in terms of a primary framework are said to be real or actual, to be really or actually or literally occurring" (47). This contrasts with other more layered interpretations of a situation considered to be further removed from 'reality,' such as the enactment of a story in the staging of a play, or the deception practiced by a con artist. In the case of someone who is otherwise immersed in a virtual world, descriptions such as 'tapping one's fingers on a keyboard', 'directing one's gaze at a video monitor screen', and 'moving a computer mouse with one's wrist' are usually accepted as descriptions of what is "actually" happening in "RW." Relative to understanding the situated use of computer technology for engaging in a virtual environment, Goffman's construct of primary framework is thus useful for denoting that which is non-virtual.

Goffman further notes that recognizing a situation implies the application of a primary framework, normally enabling its user to "come to terms with all events in that activity" (347). The primary framework imparts a sense of what is going on, and also guides that person's actions, "informing and regulating many of them" (347). Thus an individual participating in a virtual world game would gear their real world actions to the conventions for playing that specific game (for example, certain keyboard shortcuts), even while their attention was focused on what was going on inside a virtual space. The notion of primary framework is nevertheless relative. To a human factors engineer concerned with force of key strokes, an ophthalmologist conducting an eye exam, or a mechanical engineer testing mouse performance, the frameworks mentioned above are likely superseded by other primary frameworks.[7] Thus Goffman's *Frame Analysis* offers a way of distinguishing RW from 'virtual worlds,' and at the same time supporting explanation of activity in each.

[7] Similarly, use of the expression "RW" implies that someone immersed in a "virtual" world is applying a non-RW frame as their primary framework.

4 Simulated Images and Processes

The "environments" of virtual worlds are comprised of simulated images and processes enabled by technology, as in the case of the flight simulator. Yet to participants in virtual worlds, these simulated environments are perceived as virtual objects and events resembling real world objects and events. Goffman's *Frame Analysis* offers a way to understand and explain these correspondences as well. To keep things simple, I start with an elementary case of a computer user working with virtual "folders" and "documents" on a virtual "desktop." Such simulated images and processes are so common today that it is easy to forget that mapping between "real" desktop, folders and documents on the one hand, and virtual desktop, folders and documents of graphical user interfaces on the other, was a major innovation historically,[8] and that understanding how to employ the analogic mapping was initially something of an exercise.

4. 1 Meaning in/of Simulated Images and Processes

For understanding the relation of simulated images and processes of on-screen 'desktop,' 'folders' and 'documents,' to situated action, Goffman's concepts of 'key' and 'keying' are useful. He describes these:

> a central concept in frame analysis: the *key*. I refer here to the set of conventions by which a given activity, one already meaningful in terms of some primary frameworks, is transformed into something patterned on this activity but seen by the participants to be something quite else. The process of transcription can be called *keying*. (43-44, emphases added) [9]

The distinction between primary framework and keying is significant in terms of how the activity is described and its meaning. Compared to a primary framework in which an activity is considered "real or actual, to be really or actually or literally occurring", a keying of that activity is considered "not literal or real or actually occurring" (47). The examples that Goffman offers include, threat, deceit, ritual, staging, fantasizing, analyzing, etc.

In the example of a virtual desktop with iconic folders and electronic documents, the set of conventions for representing "actual" desktop, folders and documents via iconic images can be understood as a *key*. The frame (organizational premises) may even be explicitly described in Human-Computer Interaction (HCI) design principles, linking a bitmap image of a folder and its associated functionality with a subjective experience or belief associated with 'opening' a folder to find 'documents' 'inside.'[10] Rather than typing on a keyboard as in the previous section,

[8] First invented by Doug Engelbart at SRI, the innovation was developed at Xerox PARC and then moved into production by Apple Computer, Inc.

[9] Goffman derives the term "keying" from an analogy to music—i.e. transcribing music from one key to another, although he acknowledges that musical "mode" rather than "key" might actually be more accurate (44).

[10] This is sometimes explained in HCI via reference to a 'mental model'; I avoid that term because it implies the model resides within the subject, whereas Goffman's frame and

the typist could now be understood/explained as relying on a specific key in perceiving herself as "typing a quarterly report"; the screen gazer employing another key in watching a live videocam stream; and the mouse user might describe his behavior as "formatting a marketing presentation."

Goffman notes that concomitant change in activity between a primary framework and a keying may be quite minor, but its effect on the descriptions that participants would offer relative to "what's going on" can still be vast:

> the systematic transformation that a particular keying introduces may alter only slightly the activity thus transformed, but it utterly changes what it is a participant would say was going on . . . . A keying, then, when there is one, performs a crucial role in determining what it is we think is really going on. (45)

The keying concept therefore provides a useful way of underscoring distinctions in perception and intent that accompany similar sets of actions in different virtual worlds, as for example between a claims processing clerk and a tech support engineer both pressing the same keys while gazing at the same simulated images on the same machine. Applying different keys to the same patterns of physical actions, the clerk is enacting the "paying claims" key, while the engineer could be invoking the key of "debugging a software glitch." Goffman's approach highlights how selection of a key is closely related to social conventions. This helps to account for the numerous cases in the literature on virtual teams where participants interpret simulated images and processes in ways consistent with their locally situated community or occupational group rather than consistent with other members of their virtual team [9-11].

4.2 Immersion in Simulated Images and Processes

The experience of feeling "immersed" in a virtual world is another common aspect of virtuality. For this, Goffman's term '*involvement'*, which is a second aspect of frame, serves well. It denotes the extent to which an individual's attention and emotions are focused on and engrossed in an activity.

> Frame, however, organizes more than meaning; it also organizes involvement. During any spate of activity, participants will ordinarily not only obtain a sense of what is going on but will also (in some degree) become spontaneously engrossed, caught up, enthralled. (345)

Involvement in simulated images and processes, paired with keyings closely correlated with material reality, enables situated activity to seem convincingly real in a virtual sense. The more 'involved' the user becomes in the simulated images and processes, the more believable the transformational keying becomes.

Goffman notes that frames normally include normative upper and lower bounds on involvement: "All frames involve expectations of a normative kind as to how deeply and fully the individual is to be carried into the activity organized by the frames" (345). Such norms associated with appropriate intensity of attention in

---

organizational premises connote a more coherent bridging between organization of subjective experience and organization of (external) activity.

virtual worlds are revealed when degraded technological capabilities do not support normal involvement and comments of frustration over "slow response time" are heard. Similarly, people who frequently transgress the upper bounds on normative involvement may be labeled as "addicted to computers," while those who operate below the lower bound are more likely to be considered "Luddites" or "computer illiterate." Taking this approach one step further, another common attribute of virtuality is that simulated images and processes are often designed specifically to intensify involvement, as in the case of computer games.[11]

5 Virtual Interaction

Virtual social interaction–as in computer-mediated interaction of a virtual team—is a particularly important arena of virtuality. Interaction involves alternating turns of action by participants with attention directed toward a common focus of activity. In the co-present case, interaction also involves mutual monitoring and awareness by participants of each other and their alternating actions. Each participant responds (or reacts) to the actions of the other in turn, so that involvement in the interaction is thus mutually sustained. This is essentially the same set of dynamics with which HCI is concerned, albeit face-to-face and person-to-person, rather than person-to-computer.

Goffman points out that with regard to co-present interaction, if one participant's attention wanders to something outside the mutual focus, the other will detect this deviation and not be able to sustain the interaction one-sidedly. In other words, if one participant fails to express proper involvement in the shared interaction, the other consequently/ necessarily also becomes less involved in the formerly mutually-constructed and sustained activity. Highlighting this effect, Goffman posits that mutual involvement in co-present (social) interaction is thus an "*interlocking obligation*" (346, emphasis added).

How and why such an 'obligation' is manifested and experienced in face-to-face interaction is a significant concern. According to Goffman scholar Anne Rawls:

> Goffman's contribution to social theory consists in the idea of an interaction order sui generis which derives its order from constraints imposed by the needs of a presentational self rather than by social structure. . . . He argued carefully over the course of his career that there were interactional prerequisites and needs of self which places constraints on interaction. . . . Persons conformed with these because if they did not their social selves would cease to exist. [12]

Goffman offers numerous examples in which participants' encounters with such constraints are marked by "embarrassment" or loss of 'face'. Scheff [13,14] further extends this perspective, positing a continuum of moral emotions ranging between pride and shame as the regulatory mechanism. In face-to-face interaction, bodily expressions of such feelings are usually evident in body language and facial expressions visible to other interactants.

[11] Goffman terms artifacts designed with this quality "engrossables" (345).

In virtual interaction, team members usually cannot directly monitor bodily expressions of each other's involvement. Nevertheless, consistent with Goffman's emphasis on *observable* action/expression of involvement, participants are often cognizant of external evidence of the other's involvement as expressed through recognizable action, for example, whether the person at the other end has responded to email or contributed expected deliverables. Even though the interaction is mediated, an attenuated version of interlocking obligation still applies. Examples of interactional constraints, based on needs of presentational self in a virtual team and contingent upon electronic signals of involvement, include the guilt experienced when delaying a response to an urgent email or the concern felt when seeing one's work forwarded by others to a broader audience. Repeated occurrences of interlocking obligation build trust for continuing interactions in the future and are especially significant for supporting virtual interaction over longer time periods.

Goffman's terminology and concepts also support viewing interlocking obligation as attenuated through technological mediation. In virtual interaction, ICT reduces the dimensions of expressed involvement to digital images and processes, thereby making it more difficult for participants to ascertain whether each 'other' is indeed genuinely involved because the bodily expressions of involvement normally recognizable in co-presence are not readily perceivable. This can help account for the abundance of spam, junkmail, phishing, and online predators in virtual worlds: the mediating technology acts as an "involvement shield," obscuring one participant's fabrication of involvement, with the interaction eventually breaking down as failures in interlocking obligation become evident.

6 Discussion

As described above, the situated nature of important aspects of virtuality can be explained using features of Goffman's *Frame Analysis*. These aspects of virtuality include contrast with the "real world"; meaning of simulated images and processes; immersion in them; and virtual interaction. Here I briefly consider a higher-level view of how this approach might contribute to understanding the broader interaction of interdependent social and technological phenomena; I use virtual teams as an illustrative example.

For virtual teams, it seems reasonable to assume that congruence [6] across team members' frames is important. In Goffman's terms, this entails isomorphic organizational premises – or linkages between their frameworks of understanding and their external activities – that ultimately require some version of parallelism in the material aspects of their ICT. This suggests the possibility of viewing two separate layers of interaction, one social and one technological, each with its own (separate) logic of interaction, which also interact with each other at numerous points. The two layers can be understood as two sides of a coin: one side is technological interoperability, the other side involves social practices effecting 'transcription' of keyings. Both layers or sides are distributed geographically, and stitched together at various points (physical locations) through human-computer interaction (HCI).

On the technological side, interoperability (of ICT) is important because it affords a material basis for congruence across organizational premises of team

members' frames. On the human/social side, frame congruence across dispersed team members can be understood as achieved via transcriptions shaped by a transitive set of interlocking obligations across locations. This view highlights the importance of complementarity between social practices that shape meaning (frames of understanding) and individuals' involvement in these practices.

How congruence between frames of understanding and frames is actually achieved when team members are dispersed, and how this congruence is maintained or repeatedly reconstructed in parallel across space and time, are issues that Goffman's *Frame Analysis* does not address. Another limitation of his approach is a reliance on conceptual typifications [15] with little explanation (apart from references to ritual and social convention) of how people ascertain which frame is appropriate to use in any specific situation. That virtual teams actually work as well as they do testifies to the diligence and creativity of individual virtual team members willing to initiate activities such as phone calls and face-to-face meetings which enable them to bring their frames into congruence and create/restore interlocking obligation, compensating for its attenuation via mediated technology.

One promising avenue for integrating *Frame Analysis* with more practice-based approaches is via ethnomethodology. Originating in work by Harold Garfinkel, the ethnomethodological approach has been identified as a good complement to Goffman's *frame analysis* [15].[12] Furthermore, the ethnomethodological approach has already shown promise in the study of computer-supported cooperative work [16,17]. The combination, therefore, may well afford a fruitful way ahead.

7 Conclusion

In this paper I have argued that Goffman's *Frame Analysis* offers a powerful approach (or in Goffman's terminology a useful "key") for understanding important aspects of virtuality from a situated perspective. Goffman's terminology and concepts afford strong potential for integrating the study of virtual action and interaction with much of what is already known about social action and interaction more generally.[13] His frame analysis provides language and concepts for distinguishing virtual worlds from each other and from real worlds, in a way that is consonant with important aspects of human-computer interaction. It also helps to account for the phenomenon of immersion in virtual worlds while at the same time it is better suited for understanding both co-present and mediated social interaction.

To recap: the contrast between the "real world" and virtual worlds can be understood through Goffman's concept of *primary framework*. How people interact with simulated images and processes can be explained via Goffman's notions of *key* and *keying*. The phenomenal experience of immersion while using ICT (especially ICT "engrossables") is well-characterized by Goffman's description of *involvement* – including both cognitive and affective components. And virtual interaction (as in a

[12] Garfinkel helped to inspire Goffman's development of *Frame Analysis* (Anne Rawls, personal communication, March 6, 2007).

[13] Goffman's work underlies and informs much of contemporary sociological and social theory [18].

virtual team) can be accounted for with Goffman's notions of *interlocking obligation* and parallel or complementary *organizational premises*.

There are several possibilities for further research utilizing these and other aspects of Goffman's frame approach. First, more thorough analyses of the relation(s) between co-present (social) interaction, human-computer interaction, and computer-mediated (social) interaction should be carried out. Such research may lead to clearer categorization of similarities and differences between these alternate forms of interaction. If this proves valuable, the approach could then be further extended to clarify how these different kinds of interaction can be portrayed in work on organizing practices involving ICT such as Yates and Orlikowski's [19-21] genre approach and Orlikowski's [22] work on scaffolding, as well as in Actor Network Theory [23,24]. While the road ahead remains challenging, selected aspects of Goffman's *Frame Analysis* appear to offer an approach worth pursuing.

Acknowledgements

Thanks to Jon Beard, John Carroll, Anne Rawls, and two anonymous reviewers for comments on earlier versions of this paper. I would also like to acknowledge my dissertation advisors, Michael Cohen and Martha Feldman, whose guidance on prior work contributed indirectly. All errors and omissions remain my own.

References

1. S. Woolgar, in: Virtual Society? Technology, Cyberbole, Reality, edited by S. Woolgar (Oxford University Press, New York, 2002), pp. 1-22.
2. L. Suchman, *Plans and Situated Actions: The Problem of Human-Machine Communication* (Cambridge University Press, New York, 1987).
3. Heidegger, *Being and Time*. (Blackwell Publishing Inc., Malden, MA, 2006).
4. M. Polanyi, *The Tacit Dimension* (Peter Smith Publisher, 1983).
5. E. Goffman, *Frame Analysis: An Essay on the Organization of Experience* (Northeastern University Press, Boston, 1974/1986).
6. W. J. Orlikowski, and D.C. Gash, Technological Frames: Making Sense of Information Technology in Organizations, *ACM Transactions on Office Information Systems* **12**, 174-207 (1994).
7. G. Bateson, *Steps to an Ecology of Mind* (Jason Aronson Inc., Northvale, NJ, 1972/1987), pp. 177-193.
8. A. Giddens, *The Constitution of Society: Outline of the Theory of Structuration* (University of California Press, Berkeley, 1986), p. 28.
9. J. Rennecker, The Myth of Spontaneous Connection: An Ethnographic Study of the Situated Nature of Virtual Teamwork, Doctoral Dissertation Thesis, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA, 2001.
10. D. Sole, and A. Edmondson, Situated Knowledge and Learning in Dispersed Teams, *British Journal of Management* **13**(S), 17-34 (2002).

11. D. Sole, and M. Huysman, Communities of Practice and the Role of Location: Revealing Limits of Virtuality and Knowledge, in *Twenty-Third International Conference on Information Systems (ICIS)*, 2002, pp. 553-61.
12. A. W. Rawls, The Interaction Order Sui Generis: Goffman's Contribution to Social Theory, *Sociological Theory* **5**(2), 136, 136n1 (1987).
13. T. J. Scheff, Deciphering *Frame Analysis*. *Sociological Theory* **23**(4), 368-385 (2005).
14. T. J. Scheff, *Goffman Unbound!: A New Paradigm for Social Science* (Paradigm Publishers, Boulder, 2006).
15. A. W. Rawls, in *Goffman's Legacy*, edited by A. J. Trevino (Rowman & Littlefield Publishers, Inc., Oxford, UK, 2003), pp. 216-253.
16. S. R. Barley, and G. Kunda, Bringing Work Back In, *Organization Science* **12**(1): 76-95 (2001).
17. W. J. Orlikowski, and S. R. Barley, Technology and Institution: What Can Research on Information Technology and Research on Organizations Learn from Each Other? *MIS Quarterly* **25**(2): 145-165 (2001).
18. 18. A. J. Trevino, in *Goffman's Legacy*, A.J. Trevino, Ed. (Rowman & Littlefield Publishers, Inc., Oxford, UK, 2003).
19. J. Yates, and W.J. Orlikowski, Genres of organizational communication: A structurational approach to studying communication and media, *Academy of Management Review* **17**(2): 299-326 (1992).
20. W. J. Orlikowski, and J. Yates, Genre repertoire: Examining the structuring of communicative practices in organizations. *Administrative Science Quarterly* **39**(4): 541-574 (1994).
21. J. Yates, and W.J. Orlikowski, Genre systems: Structuring interaction through communicative norms. *The Journal of Business Communication* **39**(1): 13-35 (2002).
22. W. J. Orlikowski, Material Knowing: The Scaffolding of Human Knowledgeability, address given to the Sixth European Conference on Organizational Knowledge, Learning, and Capabilities, Cambridge, MA, 2005 (unpublished).
23. B. Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford University Press, New York, 2005).
24. J. Law, and J. Hassard, Eds. *Actor Network Theory and After* (Blackwell Publishing Inc., Malden, MA, 2006).

About the Author

JoAnn Brooks is Research Sociologist at the MITRE Corporation in Bedford, MA, and Adjunct Assistant Professor of Sociology at Bentley College in Waltham, MA. Her research interests focus on developing social theory relevant for understanding ICT usage. She received her PhD from University of Michigan where her work concentrated on organizational studies. She holds an MS in Computer and Information Science from UMass/Amherst, and worked as a software developer on user interfaces for large and complex information spaces prior to her doctoral work.