

PENCILS AND PIXELS

Simulating electronically mediated collaboration: Three Games for Synchronous Play

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INTRODUCTION

Three gaming simulations were developed to attempt to reveal the implicit understandings embedded in computer-mediated text-based collaborative exchanges. These structures allow not just to communicate but to construct knowledge, such as when designing. Through direct engagement, these games are intended to create a space to develop awareness about the complexity of social transactions, and for the critical review of electronically-based interaction as it impacts collaborative design efforts in architecture. Specifically, they strive to focus on the effect this medium has on the processes and practices that structure the exchanges. The games are not substitutes for the "real thing," but metaphors of the media in which the exchanges occur. The context for the games is as conceptual as virtual space. The players individually and collectively have to imagine it.

All three games are based on the assumption that it is possible to simulate a *virtualization*. Electronically mediated exchanges are virtualizations of virtualizations, or metaphors of metaphors. They are applications based on abstractions of direct human communication forms. The games presented in this paper aim to materialize these virtualizations through metaphorical contexts. Designing the games required abstracting the collaboration system into a workable model, defining a symbolic structure or language for the game, and determining the procedures that would guide the moves of the players. It was necessary to find low-tech equivalents for the main components of the interactions in question to establish contrast between the physical structure of the space where the electronic collaboration exists, and its metaphor. For example, the screen becomes an index card; typing on the keyboard becomes writing with pen on paper; and the transmission becomes a movement of the arm.

The rationale for designing the three games is that tools are needed to critically discuss interfaces for online collaborative exchanges. In architectural practice, as well as in academia, the push to implement mechanisms for distance collaboration is growing. Since the mid-1990's a number of architecture schools in the U.S. and around

the world have staged virtual design studios. Much has been learned through these experiences about the procedures and structures that best support design through collaboration. However, as Brown and Duguid caution "attending too closely to information overlooks the social context that helps people understand what that information might mean and why it matters." (Seely and Duguid, 2000, p.5) In the case of "virtual communities and groups," the effectiveness of the collaboration seems to be affected by the levels of participation, domination, consensus, cooperation, and satisfaction with team processes. (Tiwana and Bush 2000)

The three games presented here simulate three forms of online collaboration: chat, newsgroup, and workgroup. The author recognizes the limitations of these forms, yet finds they encapsulate the essence of electronic-mediated exchanges. Tasks center around participating in an open discussion, elaborating on a topic (closed discussion), and designing a simple object. Exchanges are intended to occur in writing (including drawing or doodling), without speech or bodily gestures. They strive to engage the individual's attention as well as the group, make transactions explicit, while recording the form and order of the exchanges. Their design takes into consideration the collateral resources for successful design - the implicit understanding which constitutes the common background, and the need for a community of users. (Brown and Duguid 1992, p.164) The design of the games also recognizes that the "essence of collaboration is convergence." Convergence refers to the construction of shared meanings, and the need for the players to coordinate their contributions in "joint problem-solving." (Sullivan Palincsar and Rupert Herrenkohl 1999, p.164) The games require involving two basic aspects of working in a group: practices and processes. *Practice* refers to the actual application—what needs to be done, and *process* to the "know-how."

Some outcomes from participating in the games have been an improved ability to conceptualize the interfaces, a better understanding of the organization necessary to make use of them, and an increased awareness of their impact on human communication. All of these are fundamental goals at a time when online collaborative design appears to be a feasible form of architectural practice. Effective collaboration is at the core of an accomplished practice, where individuals and groups are associated to conceptualize, develop, and

complete a design. As electronic media expand collaboration opportunities over great distances, participants and non-users alike need a clear understanding of the communication constraints "within the box," as well as possibilities for change. These low-tech metaphors support reaching this understanding.

Before describing the games, a theoretical background is established to understand the games as simulations. Each game is defined by describing the scenario, roles, rules, goals, and procedures. General observations of the various iterations of the games are presented and discussed. The paper concludes by summarizing some of the outcomes of playing the games.

BACKGROUND TO THE GAMES

At the close of the 2nd millennium AD, scholars argued that we were experiencing a revolution similar to the one generated by the invention and implementation of the telegraph in the late 19th century. The telegraph initiated the collapse of the great physical distances separating communities just as a "wired" video camera placed atop a bell tower at a university in the U.S., allows someone in Buenos Aires to monitor the life of the campus. Railroads, cars, and airplanes shortened distances only in the dimension of time. Electronic communication has collapsed distances in space and time.

Technology is a cultural product constituted by ideologies, organizations and devices. We dwell in a *technoculture* that trusts the attainment of happiness on the potential to produce and progress. Our society is powered and augmented by a variety of quasi-prosthetic devices: cell phones, personal computers, Walkman, pagers, beepers, and palm pilots. Some of these are more akin to tools than to agents for change (Davis 1993), thus less enabling, creating an unequal distribution of power among people.

From a sociological perspective, culture is "a shared collection of values, goals, interests, myths, beliefs, ideas, practices, and processes." Ours revolves around digital and electronic means of communication - its production and consumption - to constitute more and more of the arena for human interaction. Actions and actors come together in a metaphorical field, partly constructed out of physical space. Digital stands for the "form" information is transformed into, and electronic is the energy system that transmits it. Form and energy are combined into a system that transmits waves through networks. Electronic pulses are collected at various points, translated, and transmitted. A mesh of networks configures a web. Messages can be sent and received in many ways, in a more or less involved fashion. The protocols for dealing with the communication are varied: e-mail, Gopher, FTP, Newsgroups, Mailing Lists, Chat Rooms, MUD, White Boards, Homepages and virtual worlds with avatars. One can

interact by writing, reading, drawing, talking, and video synchronously or asynchronously, individually or in a group.

In electronic social-textual environments, text is the basis for the exchange. Brown and Duguid equate groups formed around texts to the sociologist Anselm Strauss's concept of "social worlds." (Brown and Duguid, 2000, p.190) These authors also refer to the political scientist Benedict Anderson's *imagined* communities, which form around documents, and are thus able to create an image of the group as a single community with a single identity. (Brown and Duguid, 2000, p.190) This appears to be the case with *online* culture. Anne Balsamo labels these structures "hybrid social-textual forms."⁽¹⁾ Participation can be passive or dynamic, single or multiple-user, synchronous or asynchronous for those allowed in. Being part of this subculture means to be immersed, to have formed a bond. Each form of computer-mediated exchange demands a level of involvement or immersion. For some the quest seems to be to create a "consensual hallucinatory space."⁽²⁾ Mark Dery calls it "incorporeal interaction,"⁽³⁾ and Vivian Sobchack refers to it as interactive autism.⁽⁴⁾ Others contend it spawns a false sense of belonging, seems to be addictive, and blurs the boundaries between private and public domains.

Through digital means the landscape - a field of action where events take place - is a prosthetically empowered abstraction where invented selves invent new lives. When the power is out or the devices are out of order, the place collapses, and what was close is now very far. Humanity has invented a plethora of artifacts, many of which have not survived the passing of time, and are yet admired.

THE THREE GAMES

The games give students an opportunity to learn about and practice the protocols needed to work together in a known context with a familiar content.(Webb and Farivar 1999) The materials are simple and few to encourage players to interact and create. Successful games depend on enticing participation by presenting tasks that can only be completed by the collective efforts of a group.(Webb and Farivar 1999) Research in education has identified five rules for effective collaboration (Sullivan Palincsar and Rupert Herrenkohl 1999), that have been incorporated into the design of the games:

"Thinking must be distributed among the members of the group."

"The group must share cognitive responsibility for the task at hand."

*"All members of the group must work on the **same aspect** of the problem at the **same time**."*

"Groups must be encouraged to externalize their thoughts as they work through the problem."

"Participants must be asked to reach agreement among themselves before advancing to a new problem."

Game One: Workgroup, share text and graphic files, synchronous

A workgroup is a group of individuals working together on a task. It is usually concerned with efficiency and maintaining a relevant content. Exchanges can be asynchronous, or synchronous. In this game players must complete a task together. All the work is recorded on the cards. Cards with comments in written or graphic form can be exchanged as units, or taped as strings to maintain a memory of the chronology of the work.

Paraphernalia: Tape, index cards, color dots – four colors are needed. Color index cards can substitute color dots. Set blank cards into stacks of fifteen. Prepare as many stacks as players/teams in the game. Each player will receive a stack of blank cards with a color dot on each card. This will be the color that represents each player.

Roles: Each player is a Designer. Four Designers form a Team. There can be as many teams as necessary. Also, a game coordinator will keep the time, control game cycles, and record observations about the process of playing the game.

Rules/constraints: Players must not talk or gesture to other players. All exchanges must be written or drawn on the cards. A player's response to another player's comment card must be taped to it. A series of taped cards is a string. Players will exchange cards and strings clockwise, or counterclockwise. They can also place cards and strings in the center of the table to be collected by other players in no particular order.

Goal: Collaboratively design a small object with a simple program, such as a box that serves two purposes. The object must be described providing specific dimensions.

Steps: Groups get together and sit forming circles. The Game Coordinator explains the rules/instructions of the game, as well as the design task. Groups start working on the design of the object. Designers use the cards to exchange written and graphic comments. Game lasts between 20 to 30 minutes depending on the players' speed in completing the goal, their interest, and the availability of blank cards.

The debriefing session is the last and most important cycle of the game. In this game it is necessary to analyze the content of the exchange at the beginning of the game and compare it to the end. It is necessary to discuss the way in which the players chose to move the cards among themselves, and how they responded to each other. This game provides a setting to discuss convergence and simultaneity. Also, it allows to consider the effects of improvisation. It is significant to discuss the achievements of each, and how they organized

themselves to do it. In particular, this game is useful to discuss the concept of *seriation*, "an uneven process of change in which new artifacts or ideas emerge by partially replicating and partially innovating upon what came before." (Hayles, 1999)

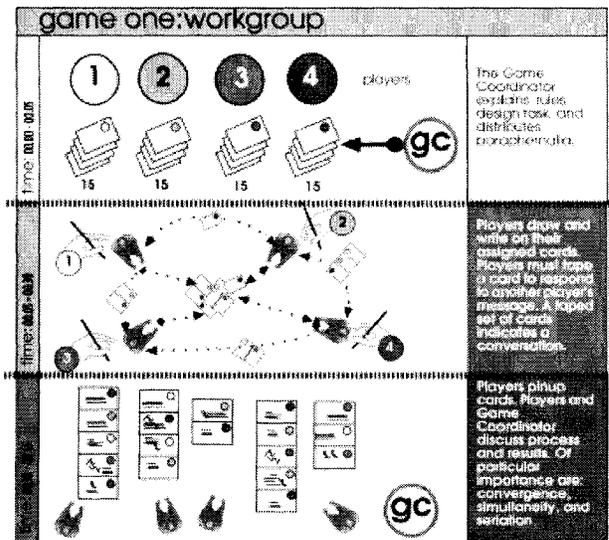


Figure 1. Diagramming events for game one: workgroup.

Game Two: Newsgroup, Moderated, Synchronous

A newsgroup is an online discussion group brought together by a common interest. Group interactions occur through asynchronous threaded *postings* or comments. However, the fact that the game is staged in real-time forces this simulation to be synchronous. Without a moderator, the participants are solely responsible for the content of the exchanges. In this game, however, a coordinator plays the role of moderator introducing topics for discussion by inserting cards with predetermined quotes, removing discussion threads (cards taped together) as well as inserting *spam*. Exchanges in a moderated newsgroup are monitored and can be purged if considered unfit for public consumption. Although *Spam* – electronic junk mail - is less common in moderated forums, a form of it has been incorporated into the game as a *pulse*. In gaming theory this is a device "used to encourage multilogue by forcing players to focus on some shared phenomena." (Duke, 1981) The players write comments on blank cards and tape them to the original quote cards. A discussion thread is a set of cards taped together. *Spam* is incorporated taping extraneous material selected by the Moderator to the comments' cards.

Paraphernalia: Tape, index cards. Set index cards into stacks of fifteen. Prepare as many stacks as players in the game. Write a number on the upper right corner of each card on a stack, corresponding to the number representing a player. Each player will receive a stack of cards with a number. Quote cards – these stand for

the comments already in progress in a newsgroup and provide the topic for discussion – will be composed and printed beforehand in preparation for the game. The quotes must tease and provoke the players.

Roles: As many Newsgroup Members as needed, and a Moderator who also serves as game coordinator. The Moderator keeps track of time and of game cycles, as well as inserts new quote cards, eliminates discussion threads (taped sets of cards and quotes), and adds *spam* material. The Moderator documents the progress of the game for later discussion.

Rules/constraints: Players must not talk or gesture to other players. All exchanges must be written or drawn on the cards. A Newsgroup Member receives quote cards from the Moderator in no particular order. Players exchange cards and strings in a clockwise or counterclockwise order. The Moderator sets the card exchange order and speed, and can change it while the game is in progress. A discussion thread is created when a player writes on a blank card with his/her number, and tapes it to the quote card or to an existing string of cards, and passes it on. A Newsgroup Member does not have to respond to all discussion threads and quote cards, but must pass them on.

Goals: Produce abundant response to selected quotes/ideas, and reach consensus on some of the issues presented. Find a way to neutralize the intrusion of *spam*. Only the Moderator must be aware of this last goal.

Steps: Players sit around a table. The Moderator explains rules/instructions. Each player receives a stack of blank cards. The game starts when the Moderator distributes the quote cards among the players. The players are expected to read the quotes, write a response on one of their cards, tape the card to the quote, and pass on the “string” to another player. Players don’t have to respond to quotes or “comment strings”, but they must pass the quote or “string” to another player. The Moderator can eliminate quotes, cards, and strings from circulation to affect the direction of the discussion, and to introduce a measure of unpredictability. The Moderator can attach to the “comment strings” any item that he/she considers disruptive to the discussion. This last stands for *spam*. The Moderator must try to “flood” the system with this extra material. The Moderator may force the players to pass cards at a slower or faster pace. The game ends when one player has used up all 15 cards. The game can last between 15 to 20 minutes.

As was mentioned before, the debriefing session provides an ending to the game, and is its most important cycle. After game two identify the most popular topics, and how interest on those topics was evident in the way the game was played. Also, discuss the way in which players chose to move quote cards and response cards around

the table, construct the “strings”, and the format of the responses. Consider how eliminating discussion threads and the addition of *spam* affected the progress of the discussion. In addition, it can be enlightening to explore the effect a passive or active player has on the progress and richness of the exchange. This game provides the opportunity to discuss how cards are merely signals, and they become messages only when a player reads it.

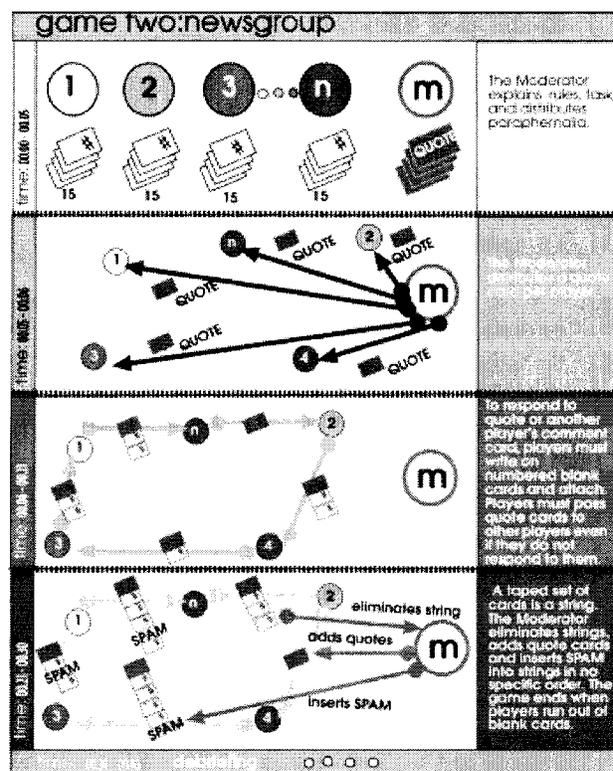


Figure 2. Diagramming events for game two.

Game Three: Chat Room

Consider the concept of the *chat room* (IRC: Internet Relay Chat) – a physical space used for the purpose of engaging in “chatter”. Chatter is an appropriate designation for it refers to “talk rapidly, incessantly, and on a trivial subject.” There are no promises the conversations will have a direction or focus. Chats relieve participants from commitment and risks. They come together at a location where they encounter familiar or unfamiliar others recognized by “screen names”. The conversation occurs synchronously. In this game the players use masks to limit communicating through gestures. Players write messages on cards signed with a pseudonym. One player – the Server – reads aloud all the message cards, except for those that are “private” messages. Private message cards are given to the team to whom they were sent.

Paraphernalia: Paper masks, index cards.

Roles: Three types of players: Agents, Resources, and Server. An Agent and a Resource form a team. The Server is the only player that can talk to communicate "public" messages to all players. Also, a game coordinator controls time, game cycles, and documents the progress of the game for discussion.

Rules/constraints: Players must not talk or gesture to other players, even within their own team. All exchanges must be written or drawn on the cards. All players, excepting the game coordinator, must wear masks to hide facial expressions. Resource players write messages, Agent players deliver them to the Server, as well as carry back to the Resource blank cards for new messages and private messages. Only one Server player is needed for the game. The Server must hide the identity of the teams from each other by mixing "private" messages with blank cards.

Goals: Engage in a textual conversation after establishing a common ground, no predefined topic. The goal of the game is to find the true identity of the teams by matching teams with their pseudonym. Once a team has been identified the game is over.

Steps: The game coordinator explains the rules and instructions. Players are divided into Agents and Resources. A Server player is selected. Agents and Resources form teams of two. To start the Server gives each team a blank card. The "Resource" players write their first "greeting" message on the blank card, including the team's pseudonym. When the game coordinator calls for distribution, "Agent" players carry the "greetings" to the Server player. The Server reads the messages on the cards aloud including the sender's pseudonym. In this way the teams become aware of the pseudonyms used by the other teams. The Server player keeps the "greetings" cards. The Server must mentally link the pseudonyms with the corresponding team to facilitate distributing messages later.

To initiate the second cycle the Server gives each Agent two blank cards, which he/she takes back to the Resource. The Resource writes two messages using the two cards. In this cycle messages can be public or private. A card with a message signed with the sender's pseudonym is a public message. A public message can be *broadcast* to all. On the contrary, if a message is private it is not read aloud, and is instead given by the Server to the Agent whose pseudonym appears as the recipient. The Server player recognizes a private message when PRIVATE is written on the top of the card, followed by the pseudonym of the recipient and the body of the message, signed with the sender's pseudonym. Private messages are to be answered privately. In this cycle, the game coordinator calls again for message distribution, and Agents carry the new messages to the Server. The Server reads all public messages, and distributes the private ones to the corresponding Agents mixed with the two blank cards for new

messages, to continue with the next cycle. The Server must be careful not to disclose the teams' pseudonyms. Teams keep private messages, and the Server keeps the public messages. The number of cycles will vary depending on the speed with which teams reach the goal of the game, for a team to identify the pseudonym of another. The game duration can be between 15 to 20 minutes. In the game sessions played thus far, participants have been unable to discover other teams' pseudonyms.

In the debriefing session all the private messages received by each team, as well as those collected by the Server are pinned up. Players must reconstruct the order of the exchanges, and analyze changes in the content of the messages. They must evaluate the way in which a common ground for discussion was established. Players must discuss the various forms in which messages were written on the cards. If a team was successful matching a team with its pseudonym uncover how the connection was made. This game is useful to discuss the phenomenon of *multiple(s)*, or multiplicity of identities. Because it progresses slowly, this is also an excellent opportunity to review the notion of interactivity.

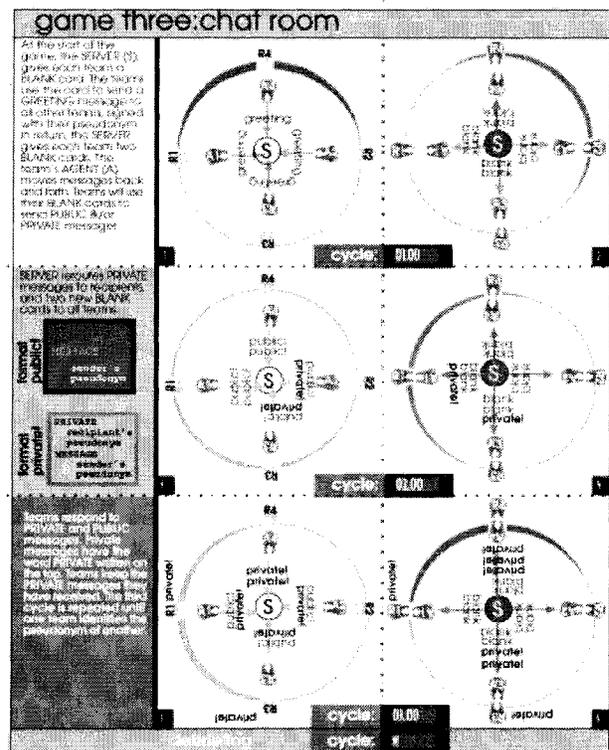


Figure 3. Diagramming events for game three.

LESSONS LEARNED

The purpose of these games is to provide an opportunity to analyze, through a combination of metaphors and direct engagement, the ef-

fects media has on some of the processes and practices that are the foundation for electronically-mediated collaborations. It is understood that the complexity of the actual events is beyond the capabilities of any of these games. As models of reality, the games are simplifications.

Each time a game is played, the performance is different. The identity and engagement of the players, and the physical setting greatly affect outcomes. Yet, a number of incidents have been re-played in the various iterations of the games.

For obvious reasons, playing the games is a quiet affair. But, the rule is occasionally broken when a group decides to use guttural sounds, as well as taps on tables and chairs, to communicate agreement or disagreement, and to announce the urgency of a message. Sometimes players laugh to themselves when reading a message on a card. In a different context this is an unimportant occurrence, but in these games it carries substantial meaning. It becomes a message. Players find it extremely difficult to remain quiet, and in the debriefing session this is usually found to be the most frustrating characteristic of the games.

It is also not surprising that players found body language is an essential purveyor of implicit understanding. A tap on the shoulder, the direction of the gaze, a wink of the eye, or moving the head can "speak" more than words. Also, when speech is not allowed, the rest of the body functions as the communicator. For some, writing was slow and inappropriate to maintain a "conversation". For other players, writing slowed down the speed of the transmission, and allowed them to be more thoughtful. For others, especially when the task was to design a simple object, the best type of communication was drawing. To a large extent, writing traces and certainly drawing marks are *gestural*.

The passing of time was perceived differently throughout the games. In general, players felt short on time at the beginning of the game when working individually on their cards, or by the end of the game when the number of messages had increased. In some cases, players left the game because they were overwhelmed by message overload. Almost all players have found the progress of the games too slow and boring when waiting for a response from other players – the *downtime*. This is exacerbated when the game has taken its own pace, because the individual cannot act unless there is input from the other players.

At the beginning of the game conflicts about the order in which the cards are exchanged, and who sends the first message are usually resolved without much discussion. On the other hand, the players spent a considerable amount of time clarifying the task given to them, and determining how to execute it. Often, players sacrificed time needed for completing the task to resolve disagreements or con-

fusion about the process. Another source of frustration, is the inability of the players or the means afforded by the games, to communicate nuances.

As to the relevance of the content of the exchanges, it varied from game to game. The "Chat Room" game appeared to deliver the most banal content. This same kind of exchange, consisting of apparently frivolous comments, was observed at the beginning of the other games. These comments demonstrate players were testing the constraints the system had placed on their ability to communicate effectively and efficiently. For, it can be argued that in this introductory period, players were defining a common imaginary field of action, which set the parameters that allowed them to complete the given task.

MEANS TO SHAPE ONLINE COLLABORATION

"Design [of work systems] needs to attend not simply to the frailty of technological systems and the robustness of social systems, but to the ways in which social systems often play a key part in making even frail technology robust." (Seely and Duguid)

Effective collaboration requires practice and careful analysis of the practices and processes that will allow a team to accomplish the tasks assigned to it. The games have shown to be appropriate demonstrating good communication requires skill and practice. They also make manifest that the vehicles for messages can take different forms. The games demonstrated that for all individuals to be involved, responsibility for completing the task needs to be distributed. It was also evident that the content for the exchange has to be relevant to the majority of the players. In addition, players found that the nuances threaded into an exchange are somewhat missed when the only means for interfacing is text. Although in a limited form, the games encourage players to recreate the constraints and possibilities of electronically-mediated exchange.

Can playing these games provide the appropriate environment for students and designers to investigate and reflect on the ways in which groups interact online without actually working online? In the chat room game a table is as much a stage as the computer screen. Yet, the performance that occurs on it is different. In the case of this game, it is mainly affected by body language. Undoubtedly, there are elements in the interaction that cannot be transposed. The setting for an online conversation is shaped by the digital interface. In these games the cards, pencils, and tape constitutes a much thinner connecting media. Certainly, the forms of information exchange found in digital transactions cannot be easily "simulated." Online collaboration brings with it a host of new conditions, among them the effects of "immersion." The limited scope of the games makes it inevitable that the psychological, as well as the technical dimension of the on-

line exchange are omitted. It is accepted new tested interfaces have already broken with the limitations of text-based ones. However, the human interactions facilitated by these new means still need to be studied.

We must participate in the construction of the structures in which we teach and practice in architecture. These need to be highly integrated collaborative environments capable of supporting a variety of communication structures and approaches to information. We also have the responsibility to make manifest and discuss the ways in which media affects our interaction. The games presented here are not proposed as substitutes for the actual electronically-mediated environments, but rather are suggested as settings to develop awareness of, and encourage the critical discussion of the social dynamics they engender. They are presented here to encourage others to stage them, and modify them as necessary.

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NOTES

¹Taken from "Feminism for the Incurably Informed;" In *Flame Wars*, Mark Dery (ed.)

²Taken from "Gibson's Typewriter;" In *Flame Wars* Mark Dery (ed.)

³Taken from "Flame Wars;" In *Flame Wars*, Mark Dery (ed.)

⁴Taken from "New Age Mutant Ninja Hackers: Reading Mondo 2000;" In *Flame Wars*, Mark Dery (ed.)

⁵For more on multiple identities see the work of Brenda Laurel and Rachel Strickland, and Allucquere Rosanne Stone.