

# Beyond Bounded Activity Systems: Heterogeneous Cultures in Instructional Uses of Persistent Conversation

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## Abstract

*This paper proposes a two-level theoretical framework for the study of CMC illustrating the principles of mediation and contextual analysis. Based on log files and interviews from foreign language users of a University MOO environment, I propose that the process of becoming a competent member of digital speech communities effects the approaches participants take toward in-class electronic discussion. This study addresses the limitations of a bounded unit of analysis, e.g., focal events within a networked computer classroom, and attempts to demonstrate that a research framework which incorporates exogenous activity systems can more fully account for the focal activity system being researched.*

## 1. Introduction

In an article examining the role of mediational artifacts, Wertsch discusses the history of pole vaulting poles (from bamboo to aluminum then fiberglass) and asks the following question — “Did the introduction of the fiberglass pole represent an extension of an existing form of mediated action, or did it create a qualitatively new one?” [44, p.66]. In an analog to Wertsch’s case study, this paper examines the relationships between foreign language activity and the material-cultural contexts of computer-mediated communication. Educational uses of internet communication tools have grown in popularity exponentially over the past decade. The analog to Wertsch’s pole vaulting example is whether (and to what degree) internet-based communications are an extension of conventional communication contexts, something qualitatively new, or a syncretic hybrid of sorts. Wertsch concludes his pole vaulting study by stating that “an existing form of mediated action was transformed by the introduction of a new mediational means” [44, p.67]. Such a transformation has been argued for in regard to the recent boom in internet-based communications [37, 21, 16], while critical [29] and more cautious voices are also present [3, 32].

## 1.1 This Study

Does internet mediation of language-based social interaction, perhaps a primary of late modern conditions for many first world students, change the activity of communication? Current research approaches to the study of synchronous CMC address this or similar questions by focusing either on a linguistic or a sociological unit of analysis. In this study I take an activity theoretical approach and attempt to show an instance of the dynamics linking these analytic levels--the relations between micro interactional activity and macro social and cultural structures. To do this I focus on the cultural-historical and institutionally specific context of University foreign language classes and their language activity within a MOO (Multi-user domain, Object Oriented) environment. The user interface is MacMOOSE, a MOO client designed by Amy Bruckman when she was at the MIT Media Lab. My data include transcripts (log files) of on-line interaction, fully transcribed in-depth interviews with students and instructors, and two semesters of in-lab observation.

The primary emphasis of this paper is to propose a two-level theoretical framework for the study of CMC illustrating the principles of mediation and contextual analysis. On one level, artifacts have a concrete materiality to them (genotype). On another, artifacts are also meaningfully and differentially defined by their immediate and historical use by communities (phenotype). What I am terming a genotype analysis has been the focus of the majority of linguistic and educational research on CMC [18, 5, 2, 22, 27, 43, 45]. Such research attributes changes in behavior and interactional dynamics to the restricted paralinguistics and structural characteristics of CMC. Importantly, the materiality of computer and network mediation does indeed contribute to changes in communicative activity. The first section of this paper, based on prior research and analysis of the log files from six second semester French classes using a MOO environment on a bi-weekly basis, will contribute to this genotype level of analysis through a discussion on turn economy, coherence, and cohesion in computer-assisted classroom discussion (CACD). This paper’s second section

presents a phenotype analysis that frames in-class digital interaction within the larger context of participants' prior and everyday uses of internet communication tools. This approach shows that exogenous digital cultures, and the process of becoming a competent member of such speech communities, play substantive roles in the ways participants carry out electronic discussion in educational settings. The purpose behind this attempt at combining genotype and phenotype analyses is to develop a theoretical approach that is generalizable to other CMC and human-computer interaction conditions.

Foreign language CACD is a specific form of persistent conversation and occurs under very specific conditions. As such, it provides a polarized case through which to examine differing communicative cultures. Additionally, research on interaction in face-to-face formal educational settings provides a baseline against which genotype and phenotype characteristics of CACD may stand out more clearly [1, 38, 39].

### 1.2 Activity Theory

The intellectual roots of activity theory date to 18-19th century German philosophy (Kant to Hegel), Marx and Engels, and most directly to Soviet cultural-historical psychology, founded by Vygotsky, Leont'ev, and Luria. Activity theory provides a framework for understanding multiple types of data and analyses under the common umbrella of a functional activity system (see Kuutti [20] for a productive discussion of the application of activity theory to human-computer interaction). A frequent term throughout this analysis, activity system, defined by Engestrom, "is not only a persistent formation; it is also a creative, novelty-producing formation ..." [8, p.68]. Any particular CACD is itself a part of other activity systems local to individuals (their prior experiences with computer technology and CMC, their own understanding of foreign language learning), as well as the activity system of the semester-long class, the activity system of the practice of being a student at a university, the goals of this effort, and so on. Importantly, a single activity system is influenced by multiple other activity systems. In this way, an activity system such as of CACD may be influenced by other educational contexts as well as by non-academic on-line speech communities.

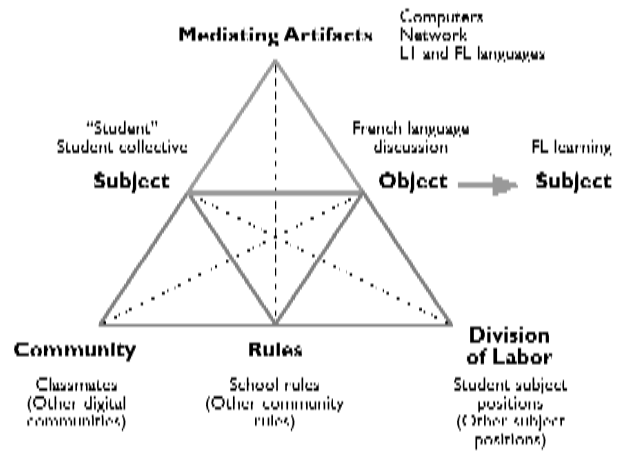


Figure 1. (based on Engestrom, [9])

This figure depicts, in larger point font, the core features of an activity system as schematized by Engestrom [9]. Engestrom identifies the participants and processes of an activity system as *subject*, *object* and *outcomes, tools and artifacts, community, division of labor*, and *rules*. I have appended the specifics of this study in smaller point text.

A *subject* is an individual or subgroup whose agency is, in the emic sense, the perspective or point of view of the analysis. The *object* is the motivation for an outcome or result. In the case of this research, the curricular and participant goals of learning and using French, and the specific motivations to carry out on-line conversations on specified topics, would be ostensible *objects* in the activity sense of the word. *Object* is also associated with the terms "problem space" or "raw material". Engestrom [8, p.67] explains that the "object refers to the 'raw material' or 'problem space' at which the activity is directed and which is molded or transformed into *outcomes* with the help of physical and symbolic, external and internal tools", which mediate the activity. The external-material artifacts in my study are the computers, network, and the MOO environment. The internal tools include the mediating signs of the participants' L2 (here French) and native languages, acquired expertise with internet communication tools, and importantly (here I'm foreshadowing one of my conclusions), the sense of communicative aesthetic accrued from participation in non-academic digitally mediated cultures.

The *community*, as Engestrom terms it, is the participants who share the same *object* that shapes and lends direction to the individual and shared activity under way. In foreign language CACD, the community includes the students and instructor as they interact within the immediate activity of CACD, but with ties to the face-to-face class. Community also extends through the associative experiences of the participants to the cultures and activities of other computer-mediated speech communities. Many of today's students, as I

think most instructors and researchers are discovering, are coming to the university with long histories of on-line social and academic experience.

Of particular value to this study is Engestrom's inclusion of *division of labor* to the activity theory approach. With a clear link to activity theory's outgrowth of Marx and Engel's work, *division of labor* refers to the horizontal actions and interactions among the members of the community, and also, as Engestrom mentions, "to the vertical division of power and status" [8, p.67], such as those between teachers and students. Within this digital foreign language communication space, I modify Engestrom's division of labor to focus on the *division of symbolic labor* which occurs within the internet communication space of the MOO as it is inhabited by French students. Within CACD, this understanding of the division of symbolic labor includes the social roles and identities implicitly and explicitly indexed and created through discourse (e.g., the institutional roles of student and instructor, as well as those of expert, cultural insider, enthusiast, biological male or female, etc.). The *division of symbolic labor* within a *community* involves *rules* and *regulational norms*, each of which afford and constrain the goings on within a functional activity system.

## 2. Genotype Analysis

The activity theoretical genotype portion of this study makes the claim that the structure of texts, and textual, literacy, and communicative practices, are tightly bound to the materiality of their conveyance and representation (e.g., stone engravings, paper, computer generated documents, and here, synchronous networked communication). The relationship between medium, the structure of texts, and literacy practices can be brought together to illustrate the substantive aesthetic, communicative, and cultural shifts which are resulting from the human practices that digital and networked technologies make possible. Part of the reason for this involves the materiality of communication as it is mediated by internet communication tools.

Since there has been such tremendous effort put into the diagnosis of face-to-face conversation, I will begin this genotype analysis of foreign language CACD in contrapuntal relation to research in the field of conversation analysis. Sacks, Schegloff and Jefferson call turn taking (as it occurs in traffic, allocation of political office, games, and for language, as "speech exchange systems") a "prominent type of social organization" [30, p.696]. Quoting Goffman, they develop the notion that "Talk is socially organized, not merely in terms of who speaks to whom in what language, but as a little system of mutually ratified and ritually governed face-to-face action, a social encounter" [12, p.135-6, in 30, p.697]. Sacks, Schegloff and Jefferson note that in relation to communication as a specialized form of "organized activity", "the presence of 'turns' suggests an economy,

with turns for something being valued--and with means for allocating them, which affect their relative distribution, as in economics" [30, p.696].

In reference to their historically important article, I will review key similarities and differences between conversation and CACD based on Sacks, Schegloff and Jefferson's fourteen point "simplest systematics" model characterizing face-to-face conversation [30]. Similarities between CACD and conversation include that speaker change occurs, turn order and size vary, and that the content of participant's utterances is not fixed (though in CACD there is a topical orientation to the discussions). The relative distribution of turns is not fixed in either conversation or CACD. In face-to-face conversation the turn allocation system is locally managed on a turn-by-turn basis and oriented toward transitioning from current to next speaker [23]. Turn allocation techniques are employed in CACD, though true allocation moves aren't possible since the floor cannot be controlled. Additionally, face constraints for rejecting a personal solicit are considerably weaker in CACD, though interlocutors will sometimes repeatedly query should their messages go unanswered. Various turn construction units can be employed in both CACD and conversation, and repair mechanisms are used in both mediums, though more sparingly in CACD.

Differences between CACD and conversation are most strongly evident in the areas of face-to-face conversational organization that do not apply to CACD. The importance of the transition relevance place (TRP), or gap at the end of a turn construction unit, is of paramount importance in face-to-face conversation. TRPs are not relevant to CACD since there is no temporally constrained competition for the floor. In this sense, the CACD "floor" is curiously a-temporal in that participants will read and post messages without concern for turn sequentiality. Due to the co-presence of multiple discussion threads, much of the work handled by sequential ordering in face-to-face conversation becomes, in CACD, the more labor intensive process of ascertaining a turn's relevance.

While numerous features of CACD reflect non-digital forms of written and spoken discourse, there are also distinctive qualities to CACD (and other forms of text-based real-time electronic communication) that tend to remain in shadow when log files are analyzed using units of analysis originally developed to segment non-digital forms of communicative activity. To address this problem, I propose the e-turn as a unit of analysis to account for the material conditions of electronic messages. Though an e-turn is based on the "turn", it does not include the notions of linear sequencing and juxtaposition that the conversation analysis approach attributes to the conversational turn [30]. Instead, an e-turn is defined as a communicative unit that takes its on-screen form from two sources, 1) the way the MOO server receives, orders, and recasts input, and 2) the form and content of the message as typed by the user.

The author of an e-turn contributes the content in the form of his or her typed message, and this dimension to an e-turn is entirely dependent on the user. The software, in this case a MOO server and MacMOOSE client, also plays a role in how the message looks on the screen. The MOO server tags the content typed in by the user with the user's character name and then distributes the message. To develop a terminology for this process, a "message" is typed in and sent by a user. A user's "message" becomes an "e-turn" when it appears on the public screen as a distinct block of text tagged with the sender's name. As a block unit, then, an e-turn is a bounded individual submission to a CACD dialogue that takes its final form, and placement on the screen, as a combination of a user's typed message, the recast and tagging of this message by the MOO server software, and its final display by the client.

This 11 line excerpt from a second semester French CACD log file, illustrates some of the principles outlined above. Students are at the start of a discussion on the assigned topic of CMC and the ways they use it in their everyday lives. I provide an English translation within ["brackets"]. The students' French has not been modified.

1. Tempe says, "Je pense que la technologie est une bien chose." [I think technology is a good/well thing]
2. Jed says, "Je deteste le predominance de les ordinateurs." [I hate the predominance of computers]
3. Jeffrey says, "Oui, je suis d'accord." [Yes, I agree]
4. Latika says, "j'aime recevoir les lettres traditional mais je pense que le courrier electronique est tres practical" [I like getting traditional letters but I think that e-mail is very practical]
5. Tempe says, "Je suis d'accord Latika" [I agree Latika]
6. Jeffrey says, "Oui, j'aime que les lettres electronique sont tres vites." [Yes, I like it that e-mail messages are very fast]

In lines 1 and 2, Tempe and Jed express contrary positions on technology. An example of inexplicit reference follows, in line 3, when Jeffrey says, "Oui, je suis d'accord." It is unclear whether Jeffrey endorses Tempe's statement that technology is a good thing, or that of Jed, who detests the predominance of the computer. As the discussion continues, however, deictics used as a cohesion mechanism become specific, for instance Tempe tagging her alignment with Latika by appending a personal address (5). In reference to Latika's line 4 e-turn, Jeffrey says, "Oui, j'aime que les lettres electronique sont tres vites." Though Jeffrey doesn't mention Latika by name, in this instance cohesion is marked by lexical mirroring--the use of the word "electronic" in both his line 6 and Latika's line 4 postings, and additionally by the

discourse marker "oui", which opens Jeffrey's line 6 contribution and marks it as a response to a prior e-turn.

Schegloff notes that the local and interactional nature of talk-in-interaction suggests that grammatical and discourse structures should be understood in part as adaptations to specific communicative contexts and partially "shaped by interactional considerations" (31, p.55). In asynchronous digital communication such as email and threaded discussion, epistolary conventions such as openings and a link to prior texts in forms such as including parts or the entirety of a prior message, have become common conventions (see Herring, [13], for a discussion of the "basic electronic message schema"). In contrast, the real-time nature of CACD relies on discourse markers and alignment phrases ("oui"; "tu a raison"), more subtle cues like lexical mirroring (repeating lexical items from a prior message), and direct addresses (tagging messages with personal names). These are the first strategies that participants in both a-synchronous and synchronous electronic communication adopt, and CACD as a subset of these broader categories is no exception. These communicative tactics transform what would otherwise be a listing of difficult to cohere e-turns into (usually) multiple, intra-strand coherent and co-existing discourse threads through a set of organizing tags based on deictics of personal reference and discourse markers indicating continuance of the thread. Due to the need to construct (after reading) sequentiality, ascertaining relevance can be a time-intensive task. The cacophony (as novice users describe it) of CACD comes to form fragmented-but-coherent conversational strands with experience.

As reviewed in a number of studies, the economy of the speech exchange system governing participation in teacher-fronted classroom settings has a formal character to it [1]. Classroom discourse has been long identified as a communicative context with particular, if also culturally variable, participation structures [28]. In face-to-face classroom situations, positioning oneself to a person or topic can occur through posture, facial expressions, and sub-vocalizations that may or may not be sensed by the other participants. Since verbal interaction is premised on linear sequences of single speakers (excepting latching, cooperative overlaps, and interruptions), individuals may or may not be able to gain the floor to explicitly mark their alignment to a speaker or theme. Though the opportunity is not always seized, CACD requires an explicit textual message (rather than a nod or facial expression), but also affords any participant the chance to post a message of support, non-alignment, solidarity, or disagreement without the constraint of needing to gain the floor. As pertains to context-identity relations, not only does CACD remove the obvious visual field (paralinguistics) and constraints on access to the floor, but the spatial field as well, since there is no "front of

the room” or a teacher standing and walking while students sit. The maintenance of institutional-discursive norms of behavior are mediated by such spatial configurations, and CACD (in the form of the MOO environment used in the study) does not reproduce these in any tangible way.

In CACD sessions analyzed by frequency and designated recipient of e-turns, though instructors do, on average, submit more total numbers of e-turns than students, whole-class interaction operates more like small group work in that students predominantly communicate with one another rather than to and through the instructor. A student characterizes the interactional dynamic this way: “We would respond directly to each other rather than just like putting all these vague statements toward the class, because there’d be like three or four different conversation topics going at one time. And I thought it was good when it was like that, rather than just one really vague thing, like, “Yes, I like technology in my life,” something like that.” In CACD, the discussion of all groups (forming distinct discussion strands in the scrolling text field) is available to all class members, and jumping into and out of topically coherent conversational strands is routine for most participants. From a division of labor perspective, the maintenance of the discussion is not the task of the instructor, but of all the participants. Herring [14, p.10] describes “loosened coherence” as an effect of CMC that can result in both the mitigating and enabling of communicative activity. The limited, textual interface of CACD and its relative incoherence encourages participants to direct questions, opinions, and arguments to individuals more often than generically to the group. The result is that many participants are engaged in personally relevant communication that their messages help create and sustain. This division of labor, of sharing the creative burden of generating discourse, has the potential to be an expansive experience for a second semester foreign language student.

Sacks, Schegloff and Jefferson provided a “conversational” entry point for this genotype analysis of the interactional organization of CACD. They comment that “an investigator interested in some sort of activity that is organized by a turn-taking system will want to determine how the sort of activity investigated is adapted to, or constrained by, the particular form of turn-taking system which operates on it” [30]. Without endorsing an argument for technological determinism (in fact I counter this argument below), this analysis has suggested that the structural properties of internet communication tools that support synchronous CACD do have an effect on the exchange structures and division of labor of these discussions. Though there is no equivalent of the transition relevance place so critical to the structuring of face-to-face conversation, exchange mechanisms of a different type remain the building blocks of cohesion and coherence in CACD just as they do in conversation. Additionally, I have also proposed the e-turn as a CMC sensitive unit of analysis.

What I provide in the second section of this paper is the participant relative views of the L2 users in this study. In synchronous communication environments such as verbal conversation, internet-based “chats”, and the institutional form of electronic conferencing I report on here (CACD), turns-at-talk mark participation in socially inscribed forms. Cole discusses the “double-sided nature of artifact-mediated actions” [6], referring on the one side to certain material qualities of the mediating artifact in question, and on the other to the phenotype of the artifact, or the qualities that become part of the artifact as it is used in historically and culturally specific ways. A socioculturally informed analysis recognizes that the mediational artifact (such as internet communication tools) flavors the actions it mediates by its essential functionality and characteristics. Reciprocally, the cultural embeddedness of an artifact like a MOO, and the goals to which it is put, in part defines how its mediational qualities are understood and utilized by users.

### 3. Beyond Bounded Artifacts: A Phenotype Analysis

A goal directed activity system is broken down into actions, defined as “goal-directed behavior that can only be understood in the context of a larger activity” [15, p.3], and operations, understood as actions that under normal circumstances are automated or routine to the agent. “Activity itself is the context” from an activity theory perspective [26, p.76]. The following discussion examines in-lab CACD through the words of the participants, with an emphasis on understanding CACD as it relates to their use of internet communication tools in other contexts, and how CACD is related to their histories with internet communication technologies. The common mediational means provides an interstice of sorts where who one can be and what one can say show both academic and non-academic discursive features.

1. Deborah says, "oui je pense que l'amour est un sujet tres complique" [Yes, I think that love is a very complicated subject]
2. Lisette says, "L'amour est vraiment tres complique, je ne le comprend pas" [Love is really very complicated, I don't understand it]
3. Amy says, "je deteste l'amour" [I hate love]
4. Amy deteste l'amour [Amy detests love]
5. Amy says, "je ne saurai jamais" [I will never know it]
6. Tim [to Amy], "vous detestez l'amour parce que vous ne pouvez pas sentir l'amour" [You detest love because you cannot feel love]

7. Amy [to instructor]: quelle est la forme du verbe 'savoir' dans le future simple? [What is the form of the verb 'savoir' in the simple future?]

Without wishing to overstate the point, Amy's turns in lines 3, 4, and 5, and Tim's severe if also (hopefully) not entirely serious response in line 6, would be examples of non-academic discourse. Amy's turn in line 7, however, is an obvious marker of her student status, and also marks an abrupt stop to the development of a potentially threatening theme.

The way students conceptually locate computers and internet communication tools is enmeshed in the varying histories each of them has with computer technology as well as the multiple contexts-of-use they participate in. I attempt to demonstrate below that artifacts organize, evoke, and create contexts for these foreign language users. Given a perspective of artifacts as mediational means that co-define the characteristics of human activity, I argue that the genotype perspective of computers as mediational artifacts provides a critical, though partial, account of the linguistic and interactional effects visible in log file analysis.

The emphasis on individual cognition within second language acquisition theory (hereafter SLA), argue Firth & Wagner [11], results in essentialized views of a large number of sociolinguistic and communicative dimensions of language use, including the roles of context, discourse and interaction (see Thorne, [34], for an extended discussion of contextual approaches to SLA). But most importantly, they point to the flat social identity of "learner" and "native speaker" as they are used as research proxy for human agents. Allowing participants themselves to frame the foreign language learning activity at hand offers some insight into how CACD operates as a functional activity system. The interview excerpts below illustrate the impact of individual histories and personal experience on language activity in digital settings. This phenotype approach responds to recent calls for ecological validity--that an analysis ought to be consistent with the participants' definition of situation [7]. In-depth interviews provide a means by which individual constructions of social situations can be gleaned. For this study, the strength of interviews as a means of data collection include the ability to discuss with students the meanings of their current on-line activity and history. The discourse that comes from asking questions which do not have closed responses provides the opportunity to develop an account based on how participants reflect on their own experience and for the analyst to understand the participant-student in broader social context.

Interviews followed a protocol of questions focused on the qualities of social engagement, language use, attitude, sense of personal and group dynamics, and history with internet communication tools. The interview protocol was developed in collaboration with Nina Wakeford (an extended and differently oriented analysis of our interview data is currently in preparation). A total of fourteen

students were interviewed by Wakeford or myself, all between 18 and 24 years of age. Eight students were in second semester French (French 2) and six came from an advanced French conversation class (French 14). From French 2 sections, the interviewees included four women and four men. French 14 interviewees included four women and two men. All interviews were between 45 minutes and one hour in duration, and were tape recorded and transcribed in their entirety. Since the focus is to understand CACD in relation to other on-line speech communities, I include only interviews with students who have lengthy on-line histories. For this analysis, interview excerpts have been organized by theme.

### 3.1 On Cultural Formation in On-line Communities

A student notes that the modality of CMC created a certain interpersonal dynamic that was largely bound to that medium:

[Interview excerpt 3.1.1] V.14. I don't, most of the people I know [in an on-line community] I don't call up, I rarely talk to them outside of email or chat, partially because it's a long distance thing, and partially because you establish relationships that are based on the computer, or something, and it's really weird to transcend that and start talking on the phone.

Another student, asked to describe CACD, said, "It's a conversation. It's something I'm so familiar with that it felt like just what it was." In the excerpt below, E14 also mirrors V14's comment (above) about the medium-specificity of relationships established on-line. E14 talks about interaction in on-line communities through an analogy to the social structure he noticed at his high school. The use of this analogy itself indicates the complex social dynamics that create the community rules and functional activity systems of on-line cultures.

[Interview excerpt 3.1.2] Interviewer: So for you, how would you characterize your on-line experience? As a tool like the telephone, or ...?

E14. No, actually it's more than that. It's like a entire social world. It's like being at school, there is a social structure at high school, people who are higher up and lower down and various sorts of webs where you can know people. And this was exactly like that. I mean \*exactly\* like that. ... And it's really a whole, a whole total world. I would spend hours and hours and hours doing that in the afternoons and stuff.

It's very weird because there were people who I knew really well, not really well but pretty well, who I knew for 2 years, and I would meet them in person and it was always really strange. And even talking with people who you know, who you met on a computer, is a different feel than

that same interaction with someone who you've never met. Because if all you get is the digital medium, a different facet of your personality gets exposed. It was kind of exciting in high school because it was a chance to hide the parts that everyone in high school knew about or whatever. It was going into a whole new thing, everyone was totally anonymous. All there was was what you wrote. Which actually caused me, causes one to spend a lot of time thinking about what you write, and being careful with what you write. Because that's the only way people have to perceive you. People have nothing else to judge you on. That was definitely a big thing was the fact that the way your personality got revealed was different than the way it did in face to face. You could assume, you could make yourself up. There were plenty of people we didn't like just on the basis of their on-line communication. And the weird thing was, I always got the feeling that the people who were really well respected on the scene, who were really cool, who people really liked, were probably in real life people who didn't get along so well with everyone in highschool. The nerds or whatever. Maybe some of those people who no one liked on the on-line, were people who in the real world were pretty and very outgoing.

Based on his description, E14 was part of a significant, persistent, and discerning on-line speech community. The way E14 talks about this "world" indicates very specific (but un-specified in his description) forms of language use and on-line behavior that were necessary for acceptance. The process of acculturation into this community was equally very specific and required careful negotiation and presentation of self. The CMC language socialization process for a growing number of students in North America is not through CACD in foreign language study. Based on E14 and A14's descriptions, it appears that for many first world undergraduate students, some with nearly a decade of computer experience, normative communicative practice is defined largely by participation in social and other non-academic digital communities.

Relating his prior experience with social uses of CMC to the foreign language MOO sessions, E14 makes this comment:

[Interview excerpt 3.1.3] E14. I mean you sort of get into it and then you're in that context of an on-line ... But most people there [other students] didn't seem like they were well versed in that world. There's a certain kind of fluency that you can tell in people when they are versed in communicating through that medium. It comes off in a subtle way in what they write and how they write it. And it's like my friends, when I talk with them on-line, and do real-time chat, we've all done it before. So we're all very comfortable in that world. It's authentic because we sort of place ourselves in that context.

In interview excerpt 3.1.3, E14 makes three points I wish to underscore:

- § Experienced CMC users can tell who is versed in on-line communication and who isn't, and this "comes off in a subtle way in what they write and how they write it."

- § There is an authenticity to CMC communication for experienced users (with the intimation that this authenticity doesn't exist, at least not in the same way, for novices). There are inclusionary and exclusionary aspects of "authenticity", and authenticity as it is expressed here is available to experienced insiders.

- § Authenticity is a process, not a product, based on user agency. van Lier makes the case that language activity is authentic when "it realizes a free choice and is an expression of what a person genuinely feels and believes", and is "intrinsically motivated" [39, p.13]. In E14's words, "[CMC] is authentic because we sort of place ourselves in that context". The investment by users in the on-line interaction is what makes CMC a viable, "authentic" communicative environment.

### 3.2 CMC as a Non-Egalitarian Communicative Medium

Countering the oft stated notion that CMC engenders a democratic and more egalitarian communicative dynamic, V14 states that diversity in experience with CMC creates a division between more and less experienced users.

[Interview excerpt 3.2.1] V14: When you use, when you try and use computer stuff, it's like really, it makes... when you try and bring technology into something, it makes a more obvious and clear-cut distinction between people, like these are the people who know and these are the people who don't know, and I think it just makes some sort of concrete thing that separates people, rather than just like nebulous knowledge as you might have in a classroom.

V14's comment brings forth an issue that I did not expect to find based on my reading of CMC research and experience working with foreign language classes in CACD environments. At the start of my data collection, I had presumed that face-to-face classroom interaction created a hierarchical division of students based on grades and performance in public in-class events (e.g., performance in oral discussions, quizzes, oral reports, evaluative instructor feedback). As a corollary to this, my hypothesis was that CACD sessions would provide a corrective educational forum mediated by writing rather than oral language ability (and this hypothesis was supported by some of the students interviewed). V14 brings to the fore another factor: prior on-line experience. And in her words, the face-to-face classroom is the less stratifying environment, while in contrast, CACD "makes a more obvious and clear-cut distinction between people, like these are the people who know and these are the people

who don't know", forming a "concrete thing that separates people" (3.2.1). V14's perceptions speak of social division and mirror the critical theoretical perspectives that mark information and communication technologies as a separator rather than a unifier of people [4]. E14, in a comment above, marked the differences between users in less divisive terms, saying only that there are telltale signs in the forms of the messages themselves that differentiate between experienced and novice users. Together, though, E14 and V14, both highly sophisticated and long-time CMC users, build a case for a set of language-culture-medium factors with the potential to disenfranchise less experienced students. In educational uses of internet communication tools, V14's comments call for an awareness on the part of instructors to the potential issue of user background and experience in the implementation of CACD, the design of task types and activities, group size, and select groupings of students.

### 3.3 Late Modern Communicative Aesthetic

In reference to participation in an earlier long-term on-line community, a student describes the importance of the communicative aesthetic that developed between community members.

[Interview excerpt 3.3.1] E14: The way in which the interactions happened were so dependent on like, perhaps trivial things, because all you have is what someone says. What's in someone's mind. That's why it kind of appealed to a certain kind of people, because it was just someone's mind. It wasn't how they looked, or wasn't their demeanor, it was just what they thought, and how they were able to say it.

Another student discusses significant experience with bulletin boards, chat and email. The excerpt below picks up the conversation at this point.

[Interview excerpt 3.3.2] Interviewer: Do you think it taught you anything, doing so much bulletin board stuff?

F2D2: Definitely.

Interviewer: About that kind of interaction?

F2D2: Well, it gave me the attitude I have, which I think you kind of have to have, that I think all those people who still do it today have. This sort of ..., it's a weird style of communication, like a lot of times it'll be like not entirely straightforward, like not saying what you mean to say, and I think I understand that. You know, that's the part I like. I guess a lot of people on AOL, the reason it's so boring is they say exactly what they mean to say, they say what they mean.

Interviewer: And which style did you use [during French CACD]?

F2D2: I used my old style, I didn't say what I meant. It was way more fun.

In response to the interviewer asking DD2 about an on-line character, he responded with this description:

[Interview excerpt 3.3.3] Interviewer: And did you feel like when you were Messiah [an on-line character created by the student some years earlier] rather than you, did you feel like you could say other things? And how did you create this character?

DD2: I think I probably would have said the same things if I was [Real name], or Devon Devonne, whatever, but I don't know, it was sort of, it was like an extension of the same thing, like, that's probably why I so much enjoyed like [French CACD], because I had done this before in an atmosphere that was totally relaxed... I'm just saying this now, it's like psychoanalysis or something...I had done it before in an atmosphere that was relaxed and people were sort of like a little bit rude and clever sometimes, I thought it was really funny, so, maybe that's why I have that perspective and like, take that attitude towards like my classmates.

DD2's comments (3.3.3) in particular illustrate that prior experience with chat informed the communicative aesthetic and attitude he adopted toward other students in CACD sessions. With F2D2 (3.3.2), truth value, of foundational importance to the discourse and conduct historically expected in higher education, is seen as relative, or perhaps even entirely suspended. In CACD sessions, constraints on hurtful behavior are diminished while creative uses of language and wit are prized. These excerpts point explicitly toward a few issues that I suggest are implicit in other statements by students, that digital communication in a growing number of cases is a mediational means for heterogeneous cultures of communication and communicative practice.

### 3.4 On the Margins of Institutional Power

In the two excerpts below, students mention the perception of the activity system of CACD as on the margins of institutional power. Other qualities characterizing a late modern communicative aesthetic are also revealed in these interview excerpts.

[Interview excerpt 3.4.1] B2: There's less supervision, seemingly, even though the teacher might be on-line also.

[Interview excerpt 3.4.2] M14: I talk more on the moo. There's less culpability there. I can tell jokes and don't see their faces.

These student comments intimate that participation in other digital cultures and the communicative practices there are implicated in the ways students colonize computers and networks in university instructional settings. To reiterate one student's comment, "It wasn't how they looked, it wasn't their demeanor, it was just what they thought, and how they were able to say it" (3.3.1). I argue that for a growing

number of students, prior and social participation in multiple digital communities is relevant to the complex issue of why computer-assisted foreign language discussion, understood as an activity system, has (some of) the characteristics it does. The possibilities and limitations students sense in CACD appear to come from multiple activity systems that include University life and goals as well as from participation in non-academic digital speech communities. Though there is evidence that students colonize digital academic spaces in ways that map to prior and other social experiences in non-academic speech communities, they also recognize that they are in a class situation and that the instructor is present. Students' relative sense of freedom and "lack of culpability" (3.4.1 and 3.4.2) illustrate a perceptual move that locates who they can be and what they can say at the periphery of institutional power. The discursive environment of the University is not absent, but the normalizing forces and conventional notions of proper student conduct in classroom contexts are weakened.

Perception of the activity system of CACD as on the margins of institutional power, then, is one phenotype feature of CACD. For foreign and second language learners, the qualities of the setting, the artifacts available, and the expectation participants have of forms of appropriate action correlate with the quality, content, and levels of language activity by participants [24]. These participant accounts of CACD indicate a confluence of multiple activity systems, some derived from non-institutional digital communication while others are more closely aligned to formal education community rules and division of labor. In part due to the fact that some students have extensive histories as participants in highly structured on-line speech communities, educational uses of real-time chat style communication illustrate a hybridity of communicative practices that bring together the rules, community norms, and division of labor of multiple and heterogeneous digitally mediated speech communities.

Foreign language research has not significantly addressed social identity as a constituent component of cognition and social practice (exceptions being Siegal, [33]; von Hoene, [40]). This is primarily due to the typically institutional location of foreign language education and its ephemeral duration in the lives of its participants. The comparative permanence of established social networks of second language learners, importantly those of recent immigrant communities, draw the bulk of SLA's attention, and a focus on social identity is not an exception. It is the discursive-institutional location of foreign language learning, and its temporal succinctness, which makes even more critical the inclusion of social identity in the theorizing of classroom and CACD foreign language discourse, since foreign language learners are often restricted to formal educational settings for the majority of their exposure to foreign language use. In a paper in preparation, I examine the issue of who students can construct themselves to be and how computer-mediated communication in particular expands or restricts

opportunities for "discursive constructions of self" [19], play important roles in language performance and development [35, 36].

#### 4. A Note on Implications for Design and Use

Tools are a way of transmitting cultural knowledge and forms of interaction. Expressing an activity theoretical perspective on human-computer interaction, Kaptelinin notes that "Tools and culturally developed ways of using tools shape the external activity of individuals and through the process of internalization influence the nature of mental processes (internal activity). The role of tools is not limited to transmission of operational aspects of human interaction with the world ... tools also shape the goals of the people who use them." [17, p.53]. Kaptelinin goes on to state that the goals of tool developers, software engineers for example, are implicit in the nature of the tools they develop, and these goals come together with the motives of users to form the structure of human activity at a given point and time. For both the continued development of communication tools and the pedagogy guiding their implementation for educational purposes, this paper suggests an assessment model emphasizing the genotype and phenotype dimensions to artifact mediated human activity.

#### 5. Summary and Conclusion

Through a bounded genotype analysis, I have attempted to document the interrelationship between the material characteristics of an artifact and its mediational effects on human activity. In a concrete sense, when the mediational means are computers and network tools supporting real-time conferencing, tactics supporting successful communication are tied to the specifics of such mediation. The genotype of CMC encourages users to develop communicative tactics that include an increase in personal addresses, the use of discourse markers to illustrate the continuance of a conversational thread, and overall to adapt to a turn exchange system that engenders a weaker sense of coherence [14]. The contextual phenotype analysis has provided insights into the importance of the language acculturation process that some of these students have undergone in on-line communities and their perceptions of how such prior experience affects their approach to CACD.

Returning to the question that began this paper, does CACD represent a new form of communication? The answer is forcibly contextual. Applying also to Werth's analogy of the activity of pole vaulting, transformation due to the introduction of new mediational means depends in large part on how agents use the new artifact. Based on CACD log files and participant reports, I have presented evidence that for a number of students, the discursive framing of foreign language educational activity is differentially configured

when mediated by synchronous internet communication tools. This genotype-phenotype analysis has illustrated CMC and CACD medium-specific features at the level of the e-turn economy and discourse tactics. Additionally, the interviews argue that CMC supports the evolution of stylistic and aesthetic forms of communication, and that fluency with these forms couple with inclusionary and exclusionary social judgements. When the activity of communication is mediated by synchronous CMC, there is evidence, then, for the \*potential\* for substantive change in communicative practice. It is important to note, however, that CACD and other forms of synchronous CMC can also be shown to parody conventional epistolary conventions.

As electronic conferencing is increasingly used to supplement, or even replace, face-to-face teaching methods in a variety of educational settings, there is a need to look at these digital spaces as social places. The interplay of participant membership in (often multiple) on-line speech communities and the material features of synchronous communication tools combine to create a complex social-material arena where multiple understandings of appropriate activity co-exist. As Engestrom notes, "Activity-theoretical studies of work and communication have thus far mainly dealt with development and learning within well-bounded activity systems" [9, p.32]. CACD is not such a system (and neither are classrooms or work places). On a methodological and theoretical level, this study addressed the limitations of a bounded unit of analysis, e.g., focal events within a networked computer classroom, and has attempted to demonstrate that a research framework which incorporates exogenous activity systems (digitally based non-academic speech communities) can more fully account for the focal activity system being researched.

Cultural artifacts (and there are no other kinds), including those of high technology, are produced by and in part productive of socio-historically located subjects. Artifacts such as a MOO environment cannot be fully apprehended from a positivist vantage point as generically "there" in the world. Such artifacts, in part, take their functional form and significance from the human activities they mediate, and the meanings that communities create through them. I have tried to adapt and apply a genotype-phenotype model to illustrate that a multiple activity systems approach offers a critical (and less researched) view of CMC generally, and of CMC as it is used in educational settings.

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