

THE QUARTERLY NEWSLETTER OF THE
LABORATORY
OF
COMPARATIVE
HUMAN COGNITION



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Center for Human Information Processing
University of California, San Diego

THE QUARTERLY NEWSLETTER OF THE LABORATORY OF COMPARATIVE HUMAN COGNITION

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Introduction

Upon superficial consideration, the articles that follow might be considered an exceedingly diverse lot. Alfred Lang grounds his discussion of dwelling in culture in the semiotic theories of Charles S. Peirce, and takes as his object-to-be-explained the reorganization of activity of a married couple. Kristin Janikas draws upon her own experience of enculturation and an interesting combination of child developmentalists and cultural theorists to analyze cultural reproduction and change in the socialization of girlhood in a part of contemporary America. Osmo Saarelma draws upon the Finnish tradition of developmental work research, which in turn has been influenced by the Russian cultural-historical, activity theory approach to human psychology; he takes as his object the organization of activity in a health care center.

Despite these differences there are interesting similarities in both theory and method which bespeak more-than-a-little affinity. One broad indicator of agreement is signaled by the phrase "non-Cartesian artefacts" in the title of Lang's article. Readers familiar with the *LCHC Newsletter* will be reminded of David Bakhurst's (April 1988) article here in which he describes Evald Ilyenkov's version of a non-Cartesian theory of cognition in which thinking is conceived of as "a mode of action of the thinking body" and mind is located "on the borderline between organism and the outside world" (taken from Voloshinov). These ideas resonate strongly in the Finnish developmental research tradition, as they do in the ideas of contemporary Russian cultural-historical activity theory with which they are associated.

A second interesting commonality is the attention paid to mediating artifacts as they transform and are transformed by the human agents who engage with each other through them. In one case the artifact may be a family chest, in another a hand clapping game, in another the job description of a health care worker, but in every case, the process of mutual constitution and transformation can be seen at work and some of the abstract, basic processes of semiotic mediation remain invariant, as Lang indicates in his discussion.

A third commonality is the way in which the authors use interviews to document the different subjective realities that can be associated with the gap between agent and artifact. Their analyses enable us to glimpse the processes of transformation in culturally-mediated activity from various "native points of view," highlight the polysemic

nature of cultural mediation, and remind us of the constant need for participants to engage in active construction of the ongoing scene.

The three suggestions I have made about connections among these articles are not meant to be exhaustive, but rather, indicative of the kinds of mutual relevance about the relationship of culture and mind that can be discovered when reading these articles as a set.

Michael Cole

Non-Cartesian Artefacts in Dwelling Activities: Steps Towards a Semiotic Ecology

Alfred Lang
Institut für Psychologie
Universität Bern

Common sense and science tend to presuppose human subjects separate from and opposed to an objective world. Questions are raised as to the adequacy of this view for understanding open and developing systems such as humans in their cultural environment. In response, a conceptual methodology is proposed. It explicates *structure formation processes* within persons and in their environment as of basically equivalent function. Throughout their ontogenetic development, individuals are building up and modifying structures in the form of dynamic memory not only in their mind-brains, but they also contribute to the formation and change of cultural artefacts in the physical and social space of their group. Both kinds of structures, internal and external, including their constitution of an ecological super-system and its development, are essential conditions of what a personal and social system can do. Humans as well are creators as they are creatures of their environment. Conceptual tools elaborated from the triadic semiotic of Charles S. Peirce appear appropriate to reconceptualize the relationship between humans and their cultural environment in a framework of semiotic ecology.

Dwelling Activities in Cartesian Perspective

The present conceptual framework has evolved from attempts to understand human activities designated by

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such verbs as "to dwell," "to abide," "to reside," "to live in," "being at home" or, in French, "habiter" and, in German, "wohnen." These phenomena withstand clear definition or delimitation (see Lang, in prep.). They can roughly be characterized as involving people and settings in relative continuity, usually small groups and houses, or parts and contents and surroundings thereof. In most cultures these phenomena bear a more private or intimate character to be distinguished from the more public settings and events of the group at large. In addition, in modern civilization they show some opposition to the institution of work and labour. *Dwelling activities*, as a rule, manifest themselves in a rather large variety and loose connection of social or solitary actions interwoven with a similarly large diversity and slowly changing compound of smaller and larger *artefacts* such as buildings, furniture and household contrivances or pieces of craft and trade. Possession or some other form of disposability of space and objects by the people involved often are of serious importance.

Psychologists have, until recently, given little attention to activities in and around homes in spite of the fact that they tend to take, on the average, roughly a third of a person's life time in Western societies, not counting sleep time (for reviews of research see Altman & Werner, 1985; Flade, 1987; Lawrence, 1987). As a rule, we believe—be it a prescientific belief or one rooted in various provinces of social science—that artefacts are somehow instrumental for the persons involved. Settings, houses, objects, and arrangements, it is said, are to fulfill an individual's basic or secondary needs, such as shelter, storage, sociality, privacy, etc., or they are to serve their *planned purpose* of better comfort and higher prestige.

Unfortunately, such instrumental explanations are quite arbitrary and also circular in their logic (Lang, 1990). First, they explain *nothing*, because neither those needs nor goals can be pointed out independently of their explananda. These terms only mirror the observable in more abstract and collective terms. Second, they explain *everything*, in that anything could eventually become a reinforcer of secondary needs and anything can in principle become a target of human planning. Both the emergence of the supposed secondary needs and the causative path from the supposed needs or goals to the observable facts are obscure.

Indeed, these theories "explain" that anything in matters of building and contriving dwellings is admissible. "Anything goes" appears to be typical of 20th century environmental design in the industrialized countries, whereas in traditional cultures building and arrang-

ing things follow constraints within the social and individual life of the people involved. In fact, dwelling activities in modern civilization, as witnessed by local, regional and national variation, are also quite highly conventionalized; deviations can meet painful disapproval. This contrasts with the widespread belief that we could do as we like. Insofar as the *limitless production of material commodities* in modern societies definitely consumes long-term resources and rapidly pollutes the planet's biosphere, suspicion arises that our instrumental understanding of space and objects in the interest of people is superficial and should be complemented.

Need- and goal-oriented theorizing is anthropocentric and, in addition, highly individuocentric. It obviously discounts our present knowledge of the human species' delicate place in the biosphere. Its background is what is often called the *Cartesian view of the world* and, in particular, of the human being. In a Cartesian view of the world, human subjects or cognitive systems (*res cogitantes*), are thought to be completely different from objects, i.e., material givens or artefacts. The latter are considered just another form of *res extensae*, although they are systematically formed by humans rather than having arisen just by themselves or by "nature." In its essence this dualistic world view opposes active subjects to passive objects, the latter being conceived as material and absolutely lawful in their behavior, the former being, in addition, imbued with a free mind.

This is not the place to discuss the manifold problems of dualism and its disguised offspring, nominalistic materialism, and their repercussions in psychology (for a comprehensive critique see Rorty, 1979). However, a growing number of scientists from different fields have recently begun investing in viable alternatives. Since Cartesian thinking and its idealistic or materialistic ramifications predispose a biased human-environment relationship, attempts at *redefining artefacts in relation to persons* are particularly desirable. The poorly understood dwelling processes offer an exemplary working place.

The present effort tries to dissolve some of the problems of dualism on a very basic level. The reader should keep this in mind when, in the following text, we pass from concrete examples to an abstract conceptual framework. Another point to emphasize is our use of a general methodological approach that has been called *conditional-genetic* and contrasted with the more common investigation of classes of substantive objects ("subjects") and their traits or behavior (Lewin, 1931; Lang, 1992b). The goal of scientific understanding cannot lie in translating into

special terms how parts of the world act upon us, their observers. Rather, it is our goal to find and formulate how parts of the world that we can discern act upon each other.

Therefore, as a second *caveat* we should remind the reader habituated to either an objectivistic or a subjectivistic approach that our non-Cartesian perspective is to open a third avenue. If it is true that materialistic reductionism cannot, by its very definition, grasp what is essential in culture, then it is equally inappropriate to consider the world, including culture, exclusively through the looking glass of mental systems, because both approaches are partial and prepossessed.

If we want to free ourselves from these opposed world views, an advisable focus for our interest might be on the processes by which persons, groups, and cultures constitute each other. The task is then to extricate from what we can observe those *genetic series* established by the interplay of structures and processes that have brought about particular dwelling settings and activities or, in other words to conceptualize what turns human-environment-relations into person-culture-systems of any specific kind. Following Peirce's implicit advice that "this act" of making "reference to a correlate," in other words, of creating or using a sign, "*has not been sufficiently studied by the psychologists*" (W2:53/1867 = CP 1.553, emphasis added), and judging his statement still correct today, I take the liberty of re-interpreting 20th century Cartesian psychological knowledge to fit my purpose.

A Young Couple's Dirty Clothes Chest

Let me start with excerpts from transcripts of an interview with a young married woman, called S., asked to talk "about some important things in their apartment" (Translation by A. L. from Slongo, 1991, p. 104):

The *Dirty Clothes' Chest* chosen by S. is one of several items S. reluctantly had to buy from her sister as the sister emigrated.

S.: The interesting thing, now, with the chest that stands in the sleeping room, is that it pleases me highly, it's in fact almost like a sea trunk, that's what it is to me, you can stow away something like the used clothes of 3 weeks or so. I don't really like to do the laundry, and if I have to, I like to have the machine full; and this is the only thing [from the sister] which I have considered, I wouldn't like to give it back to her. Because this chest stands for comfort, on the one hand (laughs!), that is, there is an awful lot of clothes going in, I can hide the things inside, I can make them

disappear, and then, on the other side, it's decorative, too. And then, the chest in addition takes charge of R. [the husband]. When he has no shirts left, you don't notice, because everything is inside the chest, he only sees it in the cupboard. Earlier, we had a smaller basket, it was overflowing already after one week, so you had to do something, you just had to go somewhere with the dirty clothes. And then, since we live here and have this large chest, it is R. who does the laundry most of the time, not me (laughs!).

...

S.: I believe, it has something to do with the capacity of the chest, of what goes in there, there is a connection, that we did the laundry less often since then, and that we did not participate in the wash-day schedule that reigns in the house. In this house, people do their laundry every week, each party has one fixed day, and when the people in this apartment left, then everybody in the house assumed we would take over their fixed day, but we didn't. And that's for me a kind of sign that I do not participate in the Swiss wash-day philosophy.

...

S.: Well, this chest, I would not like to give it back, it's a kind of freedom for me, well, a kind of revolt.

People with Their Things in Their Rooms

I cannot give here a full account of our psychological theory of dwelling activity and even less of our methodological approach designed to reconstruct formative transactions and their traces from interview and observational data (see Lang, Bühlmann, Kilian & Oberli, 1987; Slongo, 1991; Studer, 1993). The reader should peruse the above example as standing for a myriad of interlocking processes that form or modify structures within and around the persons living together.

One of our basic assumptions is that we should not consider the environmental givens as objects and spaces having an elemental and independent existence and fully specifiable character in physical terms. For, in their pertinence to humans, those are *things and places* or entities of relational quality incorporating in some way some disposition of their originators and at the same time presenting all along some capacity to determine people within their range or persons making use of them (see Lang, 1992a). Therefore, in our view, things and places are neither objective facts nor simply subjective constructions. Rather, they are *realities spanning across people and their environment*.

Conversely, this corresponds to persons being found both, or more than, subjects and objects (Lang, in print a). And while the researcher can observe "transactions" between individuals and parts of their environment, there is

no necessity to comply with that particular articulation of the world also in his or her conceptualizations of what is going on. If real is what can have effects, then the first task of science is to find those entities in the world that can have effects in a consistent manner. If individuals *per se* show different effects than persons together with their things, then persons-and-their-things or *ecological units* are real. Similarly, if objects alone compared to objects-with-their-people behave differently, the latter are realities to be understood.

It is true, our immediate apprehension seems to articulate ourselves as coherent and self-active individuals and self-contained elementary objects around us upon which we act. We seem to have some intuitive knowledge about this. But can we trust our impressions? It is obvious that many of those objects also determine people's behavior in various ways, while the freedom and power of the subjects, though evident, is rather constrained.

We do not immediately perceive groups and culture in a comprehensive and unitary way in the same way that we "see" individuals. But then, what are "individuals" and where exactly are their boundaries? It is hardly deniable that individuals as well as groups and cultures are to some degree coherent and at the same time divided into fluctuating and interacting parts. While some of the parts may appear more essential and others more accidental, in fact, any change of any part may change the whole in its potential to have effects. Thus, Peirce—in a then-premature philosophy of science statement of utmost actuality today—compares the individual *person* to "a cluster of stars which appears to be one star when viewed with the naked eye, but which scanned with the telescope of scientific psychology is found...to be multiple within itself, and on the other hand to have no absolute demarcation from a neighboring condensation" (1893, Ms. 403; see Pierce, 1986, p. 82).

No doubt, groups are themselves like clusters of stars and capable of consistent acting and developing, be it an informal or ritualized manner or through representatives or some other forms. Some degree of coherence and direction is what characterizes social systems and cultures as well as individuals. By direction I mean simply that events tend to form ecosystemic series, of which the later segments depend on the earlier ones in such a way that future steps are as much accidental as they are predictable (Lewin, 1934; Lang, 1992b). In addition, we can infer from observation that organs and even smaller divisions within individuals act upon each other in similar ways. Finally, we must conclude that it is seldom clear in what

way the whole or parts of an individual and what parts of her surroundings are really involved in what we perceive as an action of a subject.

Intuitions about coherence and differentiation of individuals and groups vary widely across cultures and change over time. So, our habitual articulation of ourselves and of object-things should be taken as one of several possible inferences rather than an undeniable intuition (see Peirce, 1868 W2:193-211=CP 5.213-317 or 1905 CP 5.462). Briefly, let us then refrain from any presupposition we are capable of avoiding about the entities involved in, for example, residential transactions and let us try to describe these processes, using the "chest" example, as they might appear to happen in a non-Cartesian view.

It has been demonstrated that our young couple and their relationship was changed in the course of a few weeks by the simple addition of the large chest to their dwelling. A considerable field of their actions towards each other and, in addition, another set of their everyday behaviors towards third parties is reported to be different than before. The couple in no way appears to have intentionally arranged any of these developments. Though S. is aware of the role of the chest, we have reason to suspect that her talking to the investigator about it has contributed to a deepening of her understanding. We can also assume that R. behaves differently than before, whether he has insight into all aspects or not. On the other hand, it would be risky to ascribe this change to any kind of "stimulation" or other direct causation going from the chest or the clothes stored therein toward S. and R. The chest, like so many other discernible items or places in the household, takes a gradually transmuting role in the series of hundreds or thousands of transactive events in the ecosystem formed by the two persons and their dwelling. It is true that in contrast to our couple, the chest as an object, if we neglect its new placement, has not significantly changed as a result of its new role with the couple. However, our task is to explain the chest's potential to influence the relationship of our couple including their footing in the wider social system.

We propose to consider the system formed by the pair and their dwelling and analyze it in terms of its emergence and change over time. The chest, or for that matter any reasonable sample of things and places, serves the investigator as a focusing method or as a device to bring the functioning of the ecological system into the open. Considering the chest separately would similarly lead us astray as would considering humans in isolation. Taking

the chest as a singular collection and arrangement of a multitude of molecules existing at a given place over a certain period of time and specifying it in terms of physical and chemical measures is just one of many possible descriptions. Equally valid are everyday verbal descriptions pointing to its functions as a vessel for all kinds of things or to its shape and ornamentation in terms of style or impressiveness. In principle many more kinds of description can be evoked and combinations thereof might be feasible.

The point is that all such descriptions are selective or abstractive and therefore approximative only. A full description is simply not possible. This should become clear when we ask to what extent any trait of the chest can really be a character of the chest itself. If it would not be in a certain respect or potential effect, it would not matter at all. A trait is necessarily attributed by an observer in a certain respect, notwithstanding the fact that the trait can and should for practical purposes be grounded in reality. On the other hand, to include all attributable characters or potential effects that might, appropriately or fictitiously, ever be found in connection with this or that chest would be a nuisance. So we have to refrain from characterizing things as such or to glorify one particular ("objective") description above all others and, instead, explicate the context of their having effects we are factually interested in. This means to conceptualize people and things in places of inter-activity as evolving ecosystems.

Semiotics appears to be a suitable tool for this task because of its potential to overcome the Cartesian split between the supposed objective and subjective worlds. In Peircean semiotics, both cognitive systems and artifacts are similar in many respects, because they can be seen as sign-types. Signs are neither *material nor mental*, yet belong in a way to both of these realms (for a comprehensive reference to modern semiotics see Nöth, 1990). Indeed, Peirce considered "thought" (CP 5.594/1903), "human beings themselves" (CP 5.314/1868 = W2:241), and perhaps "the entire universe," including artifacts, to be composed of signs (CP 5.448/1906; Peirce exaggerates a bit). "But a sign is not a sign unless it translates itself into another sign in which it is more fully developed" (CP 5.594 /1903). The question, to be asked of cognitive systems as well as of artifacts, is how they can be translated into other signs. In other words: how do signs come about and how do signs have effects? Obviously, in many cases, people are involved.

The Semiotic Function Circle

It might be advisable, then, for psychology to combine forces with semiotics (Lang, in print 1993). A dia-

grammatic approach is perhaps helpful (a) for introducing semiotic tools and (b) in applying them to the human-environment-in-development constellation (see also Lang, 1992c and in print b).

Let us represent *Semiosis* or the *process of triadic structure formation by the semiotic arrow*, i.e., the directed symbol composed of a circle for the origin or source, a rhombus for the resultant anaform and a band mediating between the two, i.e., interpreting the source into its anaform (Figure 1, top). Origin (semiotically: *referent*), mediator (*interpretant*), and resultant anaform (*presentant*) are matter-energy-formations or structures; all three are entities that can in principle be empirically pointed out in their structure or process manifestations. By *anaform* I mean any discernible formation that is semiotically related to two other structures, be it by structural similarity or complementarity (iconically), by genuine causation, contingency or antagonism (indexically) and/or simply by habit or tradition (symbolically). The anaform may be seen as the sign carrier.

Any one of the three parts of the triad are naturally matter-energy-formations (or formations for short) with their respective characteristic binding and effect potential. However, only the three together as a unit is a triadic sign, i.e., a relative implying "meaning." This difference is of utmost importance and often neglected even in semiotics. Any formation can accept and produce effects *by its proper disposition*. Such are dyadic relations and are studied primarily by the physical sciences.

On the other hand, many formations can also induce effects under suitable circumstances that imply a triadic relative which is the proper topic of semiotics. In an encounter with certain other formations the effects of some formations can go beyond their proper dispositions and actually bring about a third formation, called their anaform. Semiosis is thus the process of interpretation of a referent into a (re)presentant. In their sign-character, formations have effects *based on their embeddedness in a contextual history*. We can only understand these effects when we can explicate their semiotic embeddedness. While the physical effects of formations have a necessary or chance character, the semiotic effects based on their contextual embeddedness are unique. They could as well be quite different, had their history taken another course. However, due exactly to their semiotic embeddedness, they demonstrate some degree of regularity between necessity and chance or, in other words, a kind of lawfulness-with-freedom. In our intuition we therefore perceive the latter as carriers of "meaning," while the former must just be taken as they are.

Common semiotic parlance would define the anaform as a sign standing for or replacing in some respect its referent. In contrast, I prefer in line with Peirce to say that the anaform (his "representamen") presents the triad, i.e., it proffers the quintessence of the encounter between referent and interpretant for further semiosis occasions and is thus founding chains of mediated effects or history. The triadic character of this concept of semiosis is to be emphasized and it should be clear that this conception requires no split of the world in a material and a mental fraction. The essential point appears simple enough: to represent an entity, a medium is vital if the entity is to have effects through something other than itself.¹

As a physical entity the young couple's chest weighs on the floor with its mass in the gravity field, or it actually prevents other formations to pass through its location. As a sign-type the chest is interpreted by an animal as potentially preventing it from passing or as (im)possible to move around. This presumes a suitable perceptual-cognitive system in the encountering animal, i.e., an appropriate interpretant. For a suitably experienced human seeing the chest a wealth of general and idiosyncratic potentialities

are stirred, consciously or not: sumptuous, container, to be opened from top, antique, richly ornamented, bought from sister, original property of aunt Clara, no need to do the laundry, "a kind of revolt."

The triad can be dealt with as a structure or as a process. From the *process perspective*, one of several equivalent descriptions would emphasize the encounter of two preexisting structures, the referent and the interpretant, giving rise to a third, the anaform presentant. It is of no import whether the parts of the triad are physically transient or lasting. So, a sentence printed on paper would be a referent formation available over time for a reading capacity interpretant to understand its meaning, while the spoken sentence would serve a similar referent role with a listening interpretant in just one fugitive moment. Physically, both formations are nothing but spatio-temporal matter-energy-distributions. Together with befitting interpretant structures they develop a thoroughly distinct potential. I tend to speak of formations as structures when they have a distinguished character in being stable or repeatable or reproducible. We come back to the structural perspective below.

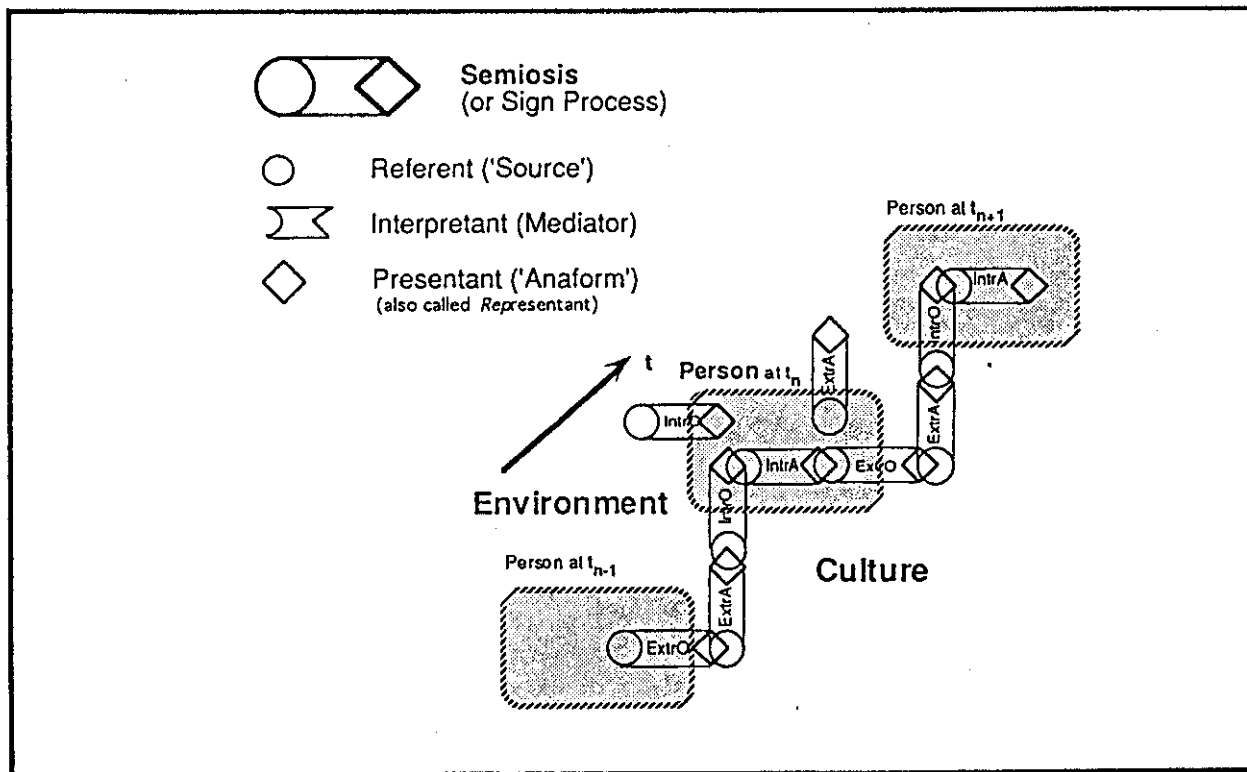


Figure 1. Diagrammatic representation of semiosis (the semiotic arrow and its parts) and its application to exchanges between persons and the world in time

The illustrative diagram (Figure 1, bottom) applies these semiotic concepts at the process level to the ecological situation. The schema represents the world as the white surface of the paper with entities in the world rendered as inscribed formations. The world changes over time from left bottom to right top. The individual *person* we are interested in is depicted at three successive points in time by the filled-in rectangle. Exchange processes—one might think of them as “metabolism” on the information level—between the person and the world are indicated by semiotic arrows. In those aspects the person can relate to it, receptively or effectively, the world becomes the person’s *environment*.

There are semiotic processes spanning from the environment into the individual (IntrO) and from the individual into the environment (ExtrO). In addition semioses occur within the person (IntrA) and also totally outside the person (ExtrA), the latter usually involving other individuals (see below). A cardinal feature of our approach is the thesis that all of these four classes of processes are of *essentially the same nature*, in that they can be conceived as triadic semiotic processes resulting in an anaform implying an interpreted referent. On the other hand, the four types of semiotic processes can be distinguished on the basis of the location of the involved referent and presentant structures. See Lang (1992c; in print b) for a more elaborate presentation of this semiotic conception inspired by and elaborating on Peirce. The reader should be warned again that the present approach to

semiotics is not of the “something-stands-for-or-signifies-something(-to-somebody)” kind but conceives of semiosis as a general form of causation and a device for creating memory and history (see Lang, in print b).

In Figure 1 we have indicated IntrO- and ExtrA-processes as coming from and going to the environment in general. Evidently these refer, quite generally, to perceptive and actionable processes, i.e., the taking into account by the individual of her environment and of having effects into that environment. In addition, we have diagrammed IntrO- and ExtrO-processes that, together with IntrA- and ExtrA-processes tend to form genetic series (see above and Lang, 1992b). While the first two are ecological processes relating the individual to her environment, the latter two correspond to psychological processes proper and to social and cultural processes respectively.

In Figure 2 these processes are diagrammed schematically abstracting from time and relating them cyclically. This conception elaborates on the idea of the *Function Circle* of Jakob von Uexküll (originally 1906, see 1934/1991) reformulating it semiotically and adding the IntrA- and ExtrA-phases. If we conceive the four phases in the framework of semiotic ecology as triadic structure formation processes, it is easy to see that the circle in fact goes in a spiral through time and implies the ecological basis of co-development of a living system within its environment. This is so because each of the four phases

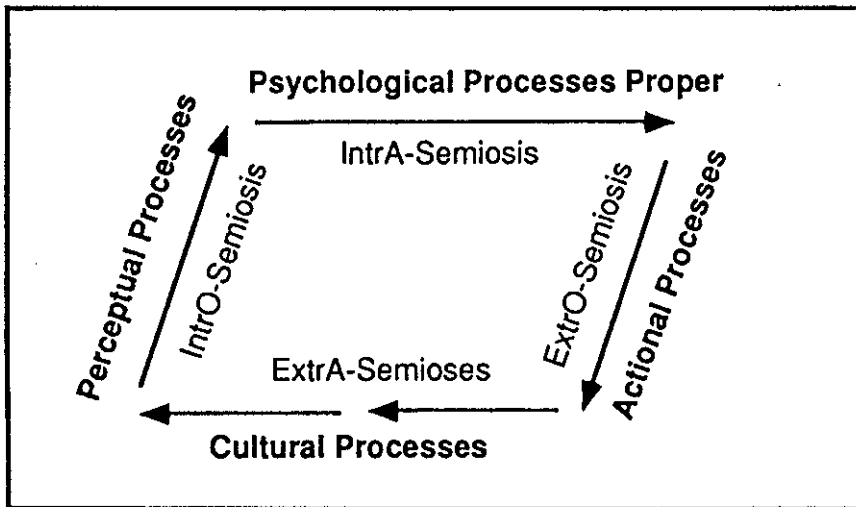


Figure 2. Four-phased function circle (spiral) with the processes relating living systems to their environment in common and semiotic terminology

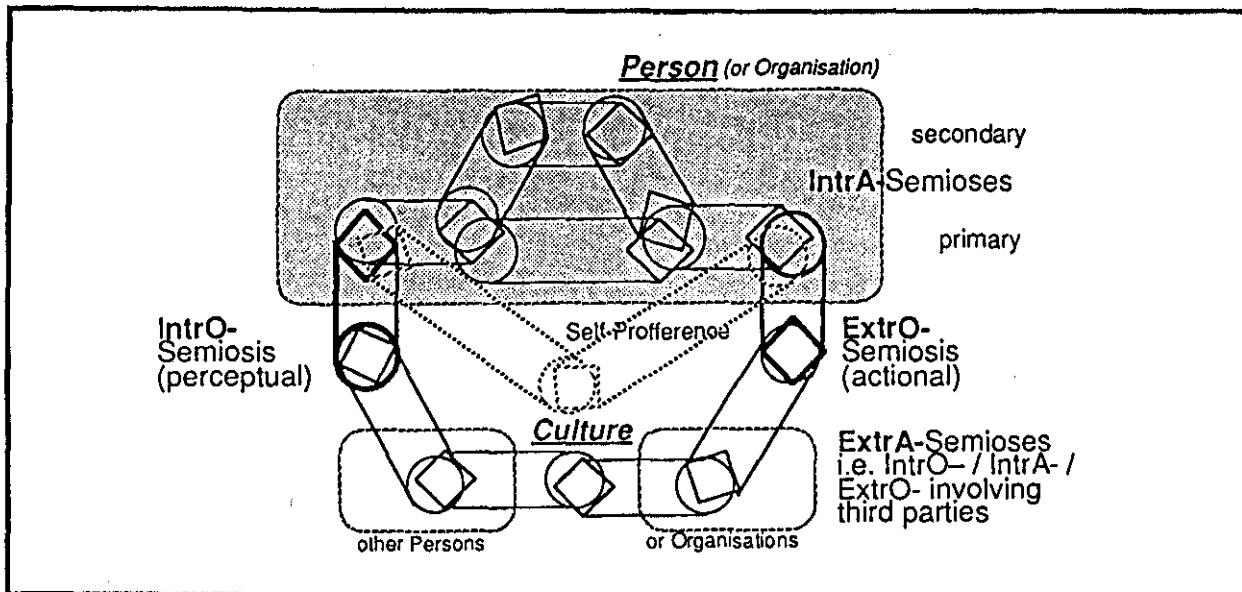


Figure 3. The semiotic function circle and the role of IntrO-, Intra-, ExtrO-, and ExtrA-semiosis in constituting persons and culture

has the potential to create *self-referent dynamic memory structures* (an anaform presentant of itself) which can enter in later phases in the same or later cycles either in the form of referents or of interpretants to contribute to the emergence of an ongoing sequence (process) or network (structure) of semioses.

Let's consider acts of an individual that leave traces, i.e., some anaform of her condition, in her environment (*ExtrO-semiosis*, Figure 3). These presentants can be taken up, immediately or later on, IntrO-semiosically by the same or by some other person or agency within the social system. In other words, ExtrO-semioses proffer *some concrete embodiment of the actor*. These externalizations "store" some condition of the actor and keep them potentially effective as long as the anaform exists (Fuhrer, 1993). Some aspects of the actor can thus be profused everywhere and everytime the anaform can be brought up without the person herself being present. Presentants of ExtrO-semiosis, thus are a form of external or social memory (see Lang, 1992a and in print a), provided there is some suitable interpretant to make use of it as a referent in one or several ExtrA-semioses.

If this is indeed the case, the minimal condition for *communication* is given (Slongo, 1992). And if eventually the original actor becomes a member of the semiotic chain anew, the function circle is closed, no matter how many intermediate semioses intervene. To the extent that all

interpretants involved in the chain or net of ExtrA-semioses are affiliated among each other, a system of co-existing and co-constituting entities—semiotic referents, interpretants and presentants—is established which can rightly be equated with the *culture*, our target person is dwelling in (Fuhrer, 1993). One advantage of the semiotic conception lies in its dealing with processes and structure on the same terms.

IntrO-semiosis is the process of building *internal dynamic memory structures*. Take seriously the idea that any semiotic process results in a concrete formation and is unthinkable without equally concrete referent and interpretant structures. Indeed, if perception is to have effects on behavior, on problem solving; on emotional states, etc., it must leave something upon these that other, further processing can be based. Most probably, IntrO-semioses can be thought of leaving altered states, transiently or enduring, of the brain-mind, anaforms of the stimulus, if you like. This corresponds well with Peirce's idea that percepts, feelings, thoughts, etc. and, indeed, persons themselves, are nothing but signs (see above). The presentants of IntrO-semioses, like any other semiotic resultants, need not necessarily stand in an iconic relation to some stimulus, as perception psychologists appear to assume. Indexical and symbolic relations are as well possible. In fact, a semiotic conception of perceptual processes is an excellent starting point for justifying the indigenous and autochthonous nature of psychological

processes in general while at the same time assuring the adequate relatedness of the living system to the character of its environment (Uexküll, 1934).

Finally, *Intra-semioses* are fully closing the function circle. They conceptualize semiotically structures and events in the proper domain of psychological and physiological approaches to human functioning. In Figure 3 some hints are made as to levels of primary and secondary connections between ingoing and outgoing semioses. While instincts and other routine processing would be seen as semiotic paths on the relatively direct primary level, so-called higher processes would also construct and recruit secondary semiotic structures such as consciousness, imagery, language, and the self. Evidently, the mind-brain is an extremely complex structure and process about which there is a plethora of speculation and knowledge. An important methodological point is the lack of direct access to *Intra-referents*, *-interpretants* and *-presentants*; we have to infer everything based on covariation of *ExtrO-semiotic presentants* with *IntrO-semiotic referent*. In a sense, the person is semiotically one multifaceted interpretant. It is also opportune to mention, as a general heuristic that intra-personal and extra-personal structures of a given individual are unthinkable if not in a peculiar correspondence which is due to the high degree of their phylogenetic and ontogenetic and culture-genetic co-development (Boesch, 1991).

Readers should now be able to further unfold our *example of the dwelling activities* with the dirty clothes' chest for themselves. The quotation in section 2 above describes all sorts of events that can be conceptually reconstructed as *IntrO-*, *ExtrO-* and *ExtrA-semioses* in relation to S. Also some conjectures as to her *Intra-semioses* might be feasible. In addition, semioses of all phases involving R, as conjectured by S., can be used to complement the circumstances. Important *ExtrOs*, naturally in conjunction with all kinds of *IntrOs* and *IntrAs*, are preparing the course of events in connection with the purchase, placement, and dedication of the chest. Once in use, changes in perception of and actions with underwear and shirts are evident in her and him. But, correspondingly, the chest mediated through the people also changes the factual situation in the dwelling in terms of distribution of the clothes. Most dramatic, perhaps, are the changes in the time intervals for doing the laundry induced by the chest's capacity and the subsequent shift from internal to external control in the laundry schedule. The fact of parallel shifts in responsibility sharing for the laundry among the couple is only understandable on the basis of affiliated but different internal structures that manifest

themselves in changes of perception and action patterns. The extended effects of the chest hatching and strengthening certain types of social relations in the house and beyond are quite unexpected. Naturally, the chest is only one of an ensemble of external structures that carry a coordinated semiotic exchange of cultivation processes among the couple and their dwelling.

Changes on many levels and in many directions within this dwelling ecosystem have been induced by the simple addition of the chest to the household. Of course, as Ernst Boesch (see 1991) has repeatedly shown, much of this could be brought to insightful interpretation by means of careful phenomenology based on controlled observation and interview. Valuable insights into transactions between people and their cultural environment can also be gained by traditional methods (Führer, 1990). What we are lacking so far, however, is the conceptual possibility of explicating the genetic series carrying the manifest changes from the chest into the people and back to the things and places or the social system. The present sketch of some conceptual problems and tools for establishing a psychologically appropriate conception of causation can be no more than a first set of stepping stones into the larger domain of semiotic ecology.

Note

¹ Readers knowledgeable of Peirce will be aware of some divergence. I emphasize the mediating role of the interpretant in line with some of his statements (e.g., CP 1.554, 1867; 8.177, late). In addition, with the present concept of an elementary semiosis I hope to surmount some of the problems related to his subcategories of "Objects" and "Interpretants."

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Korrespondenzadresse:

Prof. Dr. Alfred Lang

Unitobler, Muesmattstr. 45

CH-3000 Bern 9

Tel. (+41/31) 65 40 11 Fax (+41/31) 65 482 12

Internet: lang@psy.unibe.ch

Hand Clapping Games: Rhythmic Recordings of Girlhood Socialization

Kristen Janikas
Solana Beach, CA

Children in a Changing Society

School-age girls on America's playgrounds and cul-de-sacs engage in a unique, child-directed game. In groups of two or more, the girls clap each other's hands while chanting rhythmic songs. The songs and motions are passed on through demonstration by older sisters, other children and, on occasion, mothers. Some of the songs heard on today's playgrounds originated in the 19th century, but many of the lyrics and movements have been changed to meet the needs of girls living in today's social world. The girls do not learn the words to the songs from books, and they have the creative license to decide which parts of the songs should be changed and what the new content should be. But they do not make arbitrary decisions. There is a reason why lines about flirting with boys still appear in many songs and why lines with racial slurs have faded away. Their choices are based on their experiences living in a changing social world. A hand clapping song from any period in history can be a record of how children relate to, are affected by, and deal with their social environment.

This paper will explore the way school-age girls integrate their social knowledge into their daily activities. Its focus will be on their involvement in the creation and adaptation of hand clapping games, or "claps" for short. By comparing textual examples of contemporary claps gathered on a Southern California playground to claps from past generations, and citing commentary by girls and women of different generations, this study will illustrate the role social knowledge plays in the formation of the claps and why the claps are an important part of girlhood social interaction.

The majority of the research that has studied children in relation to the social world has focused on children's narratives and dramatic play. Dyson (1986, p. 10) says that "children's dramatic and narrative language serves to help them make sense and evaluate their perceived real worlds." For example, a child who experiences an argument at the breakfast table one morning may "act out" the same scene

later in the day while playing house. Paley (1981) encourages the children in her class to create their own dramatic world, and finds that learning in this social environment is natural for the children. Books that aim to study children's games focus mainly on competitive games and how they are played in different countries. When children play competitive games such as *Steal the Bacon* or *Monkey in the Middle*, they usually have to follow a set of rules. The children can make slight variations to the rules, but any changes they make cannot interfere with the object of the game. Competitive games, therefore, are not vehicles for creativity in the same way that open-ended hand clapping games are.

Very few authors have written about the continuously evolving nature of hand clapping games. If a hand clapping song is highlighted, it is often treated as if it were an isolated entity, unaffected by any historical or social context. Folklorists Iona and Peter Opie (1969, p. vii) address the way children's hand clapping songs have been studied in the following passage:

These wonders on the lips of the people were looked upon almost uniformly as relics of antiquity. They were examined as if they were archaeological remains, rather than living organisms which are constantly evolving, adapting to new situations, and renewing themselves or being replaced.

In order to see why children's hand clapping games should be studied as ever-changing entities, it is necessary to understand the social worlds of children.

The social worlds of children have many facets. These include the friends they play with, the family they live with, the shows they watch on television, the songs they listen to on the radio, and the ideologies of the culture. On a given day, children may watch MTV, play tag with neighborhood kids, listen to their mother complain about wrinkles, and learn patriotism through the Pledge of Allegiance in school. All of these experiences and more make up a child's social world.

Experiences with family, peers, school, and the mass media are not new to today's generation of children, but the nature of those experiences is different from past generations. Historical and cultural events have an impact on the way children behave as social beings. The social world of children today is influenced by the civil rights movement, the sexual revolution, the new structures of the American family, and the rise of easily accessible media, especially television.

Ray Brown (1976) asserts that because television has easily interpreted verbal and visual images which command so much of a child's attention, it is likely to be the most influential of mass media. Considering the current availability of video and cable, most children today have access to a much wider range of programming than previous generations had. With the invention of television came a multitude of books written about its effects on children. Most current studies have rejected the notion that television is just *chewing gum for the mind* for children. Children are not "neutral entities to be pushed this way and that by television's image; they are a constant, creative element existing in a number of interacting social and psychological contexts" (Brown, 1976). In other words, children are active participants in the television viewing process. They discuss programs with their family and peers, *act out* story lines they've seen through dramatic play, and sing about analogous social situations in their claps. It is in these ways that children deal with the social knowledge they gain from watching television.

Social Choreography

Since girls are not under the supervision of authority figures such as teachers and parents when playing hand clapping games, they are free to be creative in how they play them. This freedom is an ideal environment for what we might call "social choreography." A choreographer for a 1992 production of *The Nutcracker* must create new movements to music that hasn't changed, and the new choreography may alter the show as a whole. In the same way, girls take the rhythms that have been passed down through generations and choreograph new words and movements to them. It is important to note that the changes are not arbitrary. They are based on a child's experience in the social world. The following clap played by 8-year-old girls illustrates a change in one line of a song:

Old Version	New Version
Miss Sue from Alabama	Miss Sue from Alabama
Sitting on her rocker	Sitting on her rocker
Eating Betty Crocker	Eating Betty Crocker
Watching the clock go	Watching the clock go
Tick Tock banana rock	Tick Tock banana rock
A-B-C-D-E-F-G	A-B-C-D-E-F-G
Wash these spots right off of me	I got plastic surgery
Moonchuck freeze!	Moonchuck freeze!

Although only one line differs between these two versions, it is a change that calls into question little girls' knowledge of the American cultural construction of beauty. What could plastic surgery possibly mean to an 8-year-old

girl? Sarah, 8-years-old, says plastic surgery is "what you do when you have this really big nose." "Or when you have really fat legs," Jennifer, also 8, interjects, presumably referring to liposuction. It is not difficult to imagine where these girls might develop their ideas about beauty ideals considering that they are active participants in a social world. Perhaps their views are shaped by Michael Jackson's constantly changing appearance, or by beauty advertisements, or by their own mothers' wishes for liposuction. Whatever the case, their new words to the song illustrate their role as social choreographers.

The Choreographers

The girls participating in the hand clapping games for this study attend Ocean View Elementary, a public school in suburban Southern California. (All names have been changed to protect the informants' anonymity.) They all come from white, middle class families with additional siblings. Ranging in ages from 6 to 10-years-old, they gather in groups on the playground to engage in one of their favorite pastimes. The claps are usually played in pairs, with the remaining girls acting as an audience, waiting for a turn. Sometimes an audience member will interrupt the players by shouting "I know a better way to sing it." She will then choose a partner and demonstrate her new version. If the girls like it, that is, if they can relate to the new lyrics, or better yet, if they find them to be funny, they will learn and adopt the new version.

In conjunction with samples of old hand clapping songs taken from books, interviews with women were instrumental in creating a basis for which to compare the contemporary glossary of hand clapping games performed by the girls at Ocean View. The women interviewed for this study grew up in the same Southern California community as the girls and represent two different generations. Their participation supplied this study with a sample of past songs, and more importantly, explanations as to why they as young girls would never sing the songs the way the girls sing them today. Conversely, they also provided commentary as to why girls today do not sing the same songs of the their generation.

The Girls' Social and Cultural Environment

All of the girls engage in similar after-school activities. Some of these activities include Brownies, soccer, and dance lessons. They also play hand clapping games outside of school with neighborhood girls and siblings. This seems to be the place where many new songs are taught since some of the girls claim to learn the songs from

older girls, mostly preteen. Very few minority girls attend the school so it is difficult to compare the songs with those of African-American or Mexican-American girls, for example. The girls profiled in this paper have very little contact with children of other races and there are no racially-defined cliques in the school.

Their favorite television shows are sitcoms called "Full House" and "Hey Dude." Neither of these shows features a traditional family unit on the model of "Father Knows Best." "Full House" is about a single father and his three daughters, ages 4 to 12, who share their house with two young bachelors. "Hey Dude" appears on cable and follows the daily lives of four teenagers living and working on a dude ranch. It would make an interesting study to watch these shows as religiously as the girls do and look for ways in which their content is related to the content of the hand clapping games. As it is, although it is clear that the television shows are part of the larger cultural picture from which the children draw the themes in their claps, we cannot draw definite conclusions about the precise origins of particular themes.

The Mechanics of Social Choreography

Children are active members of a changing society. Social structures are not stable. They are altered by human efforts, primarily through social interaction (Borman, 1982). Any time that human beings interact with each other, whether it is on a small scale in daily activities or on a large scale through politics and war, social change occurs. The remainder of this paper will focus on three main areas of social change: sexual norms, racial norms, and popular culture. Hand clapping games act as living records of how children are affected by these forms of social change. In order for a girl to participate in hand clapping games she must share the same social knowledge as other girls in the group. All the participants must be affected by a similar social environment.

(A) Sexual norms and gender relations

Ladies and gentlemen, kids too
We two chicks are gonna re-bop for you
Re-bop, bop, bop-she-bop
Ash to ash, dirt to dirt
When the boys walk by
We're gonna flirt, flirt, flirt
Re-bop, bop, bop-she-bop
When I was young I played with toys
Now I'm older and I play with boys

Ashley and Katie, age 9

Preteen girls are in an awkward middle ground between childhood and the anxieties of puberty. Their favorite shows, "Full House" and "Hey Dude" depict teenage girls nervous about dating and boys. Much of the girls' conversation while they play hand clapping games focuses on accusations about who wants to kiss what boy. Katie, 9, one of the participants in the "Re-bop" hand clapping game describes flirtation as, "when you're out with your boyfriend but you are smiling at all the other boys instead." When Katie and her friends sing the "Re-bop" they display their social knowledge about gender relations. Other claps also reflect how the girls relate to their emerging sexuality:

Candy apple on a stick makes my tummy go 246
Not because I'm dirty, not because I'm clean
Just because I kissed a boy behind a magazine
Hey girls, want to have fun?
Here comes (insert boy's name) with his pants undone
He can wobble, he can wobble, he can do the splits
But most of all he can kiss, kiss, kiss
With his red, hot lips

Allison, age 9

Today's society views sexuality differently than previous generations did. The sexual revolution of the 1960s brought a change in how the media address issues of dealing with sexuality. Girls today acquire their mediated images of sexuality from Madonna rather than Gidget or Lucy. The point is not to criticize the amount of sexual images children receive from the media, but rather to examine how the children deal with them.

Patti, 39, was surprised by the lyrics of Allison's song. "We would never sing a song like that as girls. Sexuality was so repressed back then. There was none on TV or in songs on the radio so we had little to go by." She went on to say that if a song like that were introduced at a slumber party or something, it surely would not have been something to be sung out loud on a school yard. This particular hand clapping game that Allison and her friends play is an example of how children have taken an existing rhythm and choreographed to it new words and movements that enable the song to fit into their social world.

Another clap, Miss Suzy, traces the chronological life span of a girl from birth to death. When Kelly, 22, learned the song as a girl, Miss Suzy went from being a little girl asking for a cookie to a mother scolding her children. The girls at Ocean View have added a teenager verse in between these two stages.

When Miss Suzy was a teenager, a teenager, a teenager
 When Miss Suzy was a teenager she went like this
 Ooh Ahh I lost my bra
 I lost it in my boyfriend's car

Corrin and Sara, age 10

In this example, girls took an existing song and added a new verse that served to spice up the original. Again, this is possible because of the unique free environment in which these songs are created. They are not written in songbooks to be memorized, nor are they mediated by adult supervision. In fact, the girls would not want teachers and other adults to participate in the claps. Megan, 9-years-old, explains, "We don't sing these songs in class because Ms. Campbell wouldn't like them. She probably doesn't even know them anyway." The girls have decided that the classroom is not the place for their hand clapping games. They use the claps to form a "child collective," where they see themselves as a group of "kids" separate from adults (Dyson, 1986).

(B) Race relations

When the girls argue about whose turn it is to participate in a hand clapping game, they use "counting-out" rhymes to determine who can play. The two most common are "Bubble Gum" and "Eeny Meeny." The old and new version of "Eeny Meeny" follow:

Old Version

Eeny meeny miny mo
 Catch a nigger by the toe
 If he squeals let him go
 Eeny meeny miny mo
 (Opie)

New Version

Eeny meeny miny mo
 Catch a tiger by the toe
 If he hollers let him go
 Eeny meeny miny mo

The girls at Ocean View never sing the old version. Melissa, 21, has never even heard it before. Irma, 40, remembers singing the old version.

Everyone sang it that way. It was a different racial climate back then. My mother taught it to me like that, and I don't remember feeling guilty about singing it. I don't think my daughter knows the version I learned because I decided not to teach it to her. She must have learned the new version from her friends.

Irma had her first child after the Civil Rights movement of the 1960s. The way in which she chooses to raise her child is affected by how attitudes about race have changed in the United States in the last 30 years. In *Collective Remembering*, Middleton and Edwards discuss how the way in which things are remembered is affected

by social institutions. The authors propose that in the process of collective forgetting, we reconstruct anew what was challenged and contested in the past (p. 9). So when saying the word "nigger" became socially unacceptable in society, children stopped using it, and the song was then passed on to the Ocean View girls in its new form. The girls are able to sing the rhyme with the word "tiger" because to them no other way exists. The socially contested and challenged version of the rhyme has essentially been forgotten by the Ocean View girls.

(C) Trends and popular culture

Winston tastes good
 Like a cigarette should
 Winston tastes good like a ooh ahh

Milberg, 1976

This hand clapping song about Winston brand cigarettes appeared widely in the last 20 years but is completely absent in any form from the songs at Ocean View. Twenty years ago kids watched their favorite sitcom characters smoke and saw television ads praising the smooth taste of menthols. As American society became more health conscious, children's image of smoking changed. Julie, 8, equates smoking with drug use when she says, "I hate cigarettes because they're drugs. Plus they stink." The kids at Ocean View participate in the Say No to Drugs program at school, sporting red ribbons every day for a week. The girls may really be educated on the harmful effects of carcinogens, or it may be that smoking is simply no longer in fashion. Whatever the case, they do not want to sing about it. This particular clap has faded over time, but most others remain, altered by adept social choreographers on playgrounds just like the one at Ocean View Elementary.

Children's hand clapping games are linked to popular culture in two ways. First, hand clapping games, like popular culture, are by nature dialogic; that is, they are the product of an ongoing historical conversation in which no one has the first or last word. Rock and Roll is dialogic in that it combines artistic elements of old jazz and blues and the historical aspects of American race, class, and gender relations. In describing popular culture's dialogism, Lipsitz (1990) says:

Everyone enters a dialogue already in progress; all speech carries within it part of the social context by which it has been shaped. The dialogic model sees artistic creation as innately social and innately historical (p. 99).

When the Ocean View girls sing "Miss Sue From Alabama," changing a few verses to meet their needs, they

are participating in an ongoing historical conversation. The rhythm and words probably were created by girls in a remotely different environment, perhaps by slave children living on a Southern plantation, but when the Ocean View girls sing it they make it their own.

The second way hand clapping games relate to popular culture addresses specifically the rhythm and style of the Ocean View girls' songs and how they embody the characteristics of popular music. There seems to be a criterion for successful hand clapping lyrics, rhythms, and movements. The lyrics often sound like those of Top 40 songs. The rhythm must be in four-four time and the accompanying movements involve a lot of shaking hips.

The following is a comparison of two hand clapping songs. The first is Irma's favorite from her childhood. The second is the current favorite of Laura, Irma's daughter and a Ocean View student.

<p>I woke up Sunday morning And much to my surprise The cooties and the bedbugs Were having a game of ball The score was one to nothing Cooties were ahead Bedbugs got a home run And knocked me out of bed Irma, 40</p>	<p>Down down baby Down by the roller coaster Sweet sweet baby I'll never let you go Shimmy shimmy cocoa pop Shimmy shimmy whoa Let's get the rhythm of the head, ding dong Let's get the rhythm of feet (stomp feet twice) Let's get the rhythm of hot dog (circle hips) Laura, 9</p>
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Irma says she learned her favorite clap from her mother, and taught it to Laura a few years ago. Laura admits to playing it with her mother but hasn't taught it to her friends at Ocean View because "they wouldn't like it." So the content and style of hand clapping games have changed over time in this Southern California town. The lyrics and movements are more provocative and more characteristic of Top 40 music style and the associated forms of dance.

A Final Note

Due to inadequate literature which describes the object of hand clapping games as "to sing and clap at an increasing pattern until the clapper falters, misses a beat or a word," I am including my revised version of an entry for a children's games glossary based on the findings of this study.

Game: Claps
Equipment: Hands, voices, bodies, social knowledge, collective memory
Rules: None
Players: School-age girls
Object: To actively participate in an ongoing historical dialogue by contributing social choreography to existing rhythms. The players use shared social knowledge to both alter and understand the games. By engaging in this activity the players are simultaneously displaying their social knowledge and making sense of their ever changing social environment.

My version may not fit the expository style of standard glossary entries, but other attempts have not captured what I feel is the true object of the hand clapping game. The girls at Ocean View have illustrated that claps are not traditional competitive games where each player strives to perform better than the other. Hand clapping games are representations that provide the means by which girls collectively make sense of their social world as part of the process of growing up.

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Descriptions of Subjective Networks as a Mediator of Developmental Dialogue

Osmo Saarelma

*The Working Health Center Project
Helsinki, Finland*

Introduction

The Finnish primary health care system was reorganized by the Public Health Act in 1972. The idea was to create multi-professional teams in order to develop practitioners' skills, to democratize the working community and to provide services better tailored to the needs of the population. A rather idealistic description of teamwork can be found in a Finnish manual of primary health care from the 1970's:

Teamwork is one of the most central work forms of primary health care, when the aim is to satisfy the needs of users of health services and to hold together the large and multi-professional working community of health centers. Teamwork in health centers is not just combining individual actions but the aim is to develop practitioners' skills through exchange of experience and to get democratic experiences in an organized manner. That way teamwork can increase working motivation, prevent social differentiation which might make the practitioners deaf to the needs of users of the services (Rintanen, 1975, p.153)

The utopia of multi-professional teams in primary health care has lived ever since. Putting all primary health care personnel into one and the same organization, the health center, was an attempt to organize teams by providing favorable conditions by law.

However, a shared target population seems not to be enough to make a group of professionals collaborate.

Bruce (1980) has analyzed in an interesting way the ruptures between agencies in Scotland. A health visitor, a general practitioner, a social worker and a police officer, who worked with the same population named from a list of children under five years of age those they considered to be "vulnerable." Of the 20 children named, only one was named by two agencies. Bruce concluded that the reason why different agencies identified different children as being specially vulnerable was primarily because of their different information bases and the fact that they were not sharing the information which was readily available. Information sharing was enhanced but not guaranteed by physical and social proximity of the agencies.

This study aimed to describe how workers in the same health center organization see each other and the objects of their work in a network. In this case, the health center building provides the physical proximity. Network analysis is used to describe forms, interruptions and possibilities of the social interactions as described by the practitioners. The description is presented to the working community in order to provoke a developmental dialogue.

Network Descriptions

A group of practitioners working in the same workplace always forms some kind of a network. The ties between the nodes can be strong or weak, and the function of the ties may vary.

Network research has provided us with numerous ways to analyze networks. In sociological studies one can differentiate between analyses of the structure and the function of a network. When analyzing the structure, the focus is on the presence and number of links between the nodes or actors in the network. An example of this kind of analysis is a sociogram, which is based on the ties between nodes, for example "sexual" ties (Bradley & Roberts, 1989). A sociogram can also illustrate the strength or functional content of the links as in Boster, Johnson, & Weller's (1987) study of perceptions of advice seeking in an office.

Both types of research described above generate data directly from the actors in the network. Thus, the network descriptions are subjective in that they reflect the actors' perceptions of the links, not necessarily the links as seen by an outside observer. A more "objective" network description can be formed when information concerning the links is gathered by an outsider. In a recent Finnish study, social workers registered all the services their clients had used. The "clientship" network was formed on

the basis of this information (Pellinen, 1991). This kind of network description gives information only on the structure of the client's service providers, as identified by the social workers. The various nodes may not even be aware of each other.

In business organizations, networks are generally understood functionally. Physically, they are often built around electronic communications and their function is to spread information and hasten decision making (Charan, 1991).

The types of network description mentioned above may be classified according to the object of description and the way information for description has been collected. A schematic typology with an example of each category is presented in Figure 1.

In the development process of a working community none of the four fields illustrated in Figure 1 seems to be enough by itself. In order to understand the function of the team or the network we need both the participants' subjective perceptions of the network and more "objective" knowledge of the (potential) network formed by workers in the same working community. We also need to know the structure and the function of the network.

When analyzing the function of the network, showing the mere presence of the links isn't enough. The meaning of the links may be multiple. Using the concept of an activity system introduced by Engeström (1987), the individual nodes or actors in the network are seen as functioning systems consisting of the subject, the object, the tools in transforming the object, the community, the rules which regulate individual activities in the community, and the division of the labor. An activity system and its possible links to other activity systems is illustrated in Figure 2.

The working community is typically a network of activity systems. The goal of studying such a network is to find out how individual activity systems are linked to each other. Theoretically, from the practitioners' point of view, another worker may represent a producer of tools, of rules or of the object of the work. Other kinds of links are also possible. By describing the working community as a network of activity systems, the network acquires both structure and dynamics.

Networks of Health Center Workers

In the Working Health Center Project, 21 Finnish health centers are analyzing and redesigning their work

using the approach of developmental work research. In this process the history of health center work is used in parallel with contemporary empirical material in order to understand the contradictions in current functions and activities and to produce a new model of activity. This study draws on material collected by focused interviews of practitioners working in the health care center of Kauhava in Botnia, Finland. The interviews were done by other practitioners of the same health center. The themes of the interviews were selected to give descriptions of the activity system of the interviewee. These interviews form the "subjective" material of this study. The "objective" material was collected by the author during visits to the health center. On the basis of this material, a skeleton of the network's elements was formed. This set of elements is presented in Figure 3. The activity system of each practitioner was used as a node in the network analysis. The "official" object of the work by the definition of the Public Health Act is the population of the municipality as well as the individual client, so this element is included as well.

The historical analysis of the health care center of Kauhava showed that the object of work of various health center practitioners has changed considerably. Previously, the patients suffered from "good old" biomedical diseases; now more and more complicated psychosocial problems and chronic conditions are brought to doctors' offices. In maternity care the object of the activity had changed from merely securing a normal birth to the support of the young family. Both changes meant that individual health care workers couldn't get along using individual expertise. In order to handle multifaceted problems or support families or small communities, practitioners had to create new practices using each other's skills.

Interviews of the practitioners were transcribed and analyzed using descriptive and interpretative analysis (Tesch, 1990, pp. 115-134). All statements describing the form or content of binding or collaboration with another practitioner or actor were used in the analysis. Statements which only mentioned a connection without describing it, for example, "I am collaborating with social workers," were not included.

The statements were grouped according to the type of link. Four classes of links were found. First, there was a connection, where the activity of one worker produced something for another. This might mean producing rules, tools, or objects of the work. The second type of link was joint handling of the same object of work. The third type of link was asking for advice or referring a client, which is a form of collaboration where the object of the work is

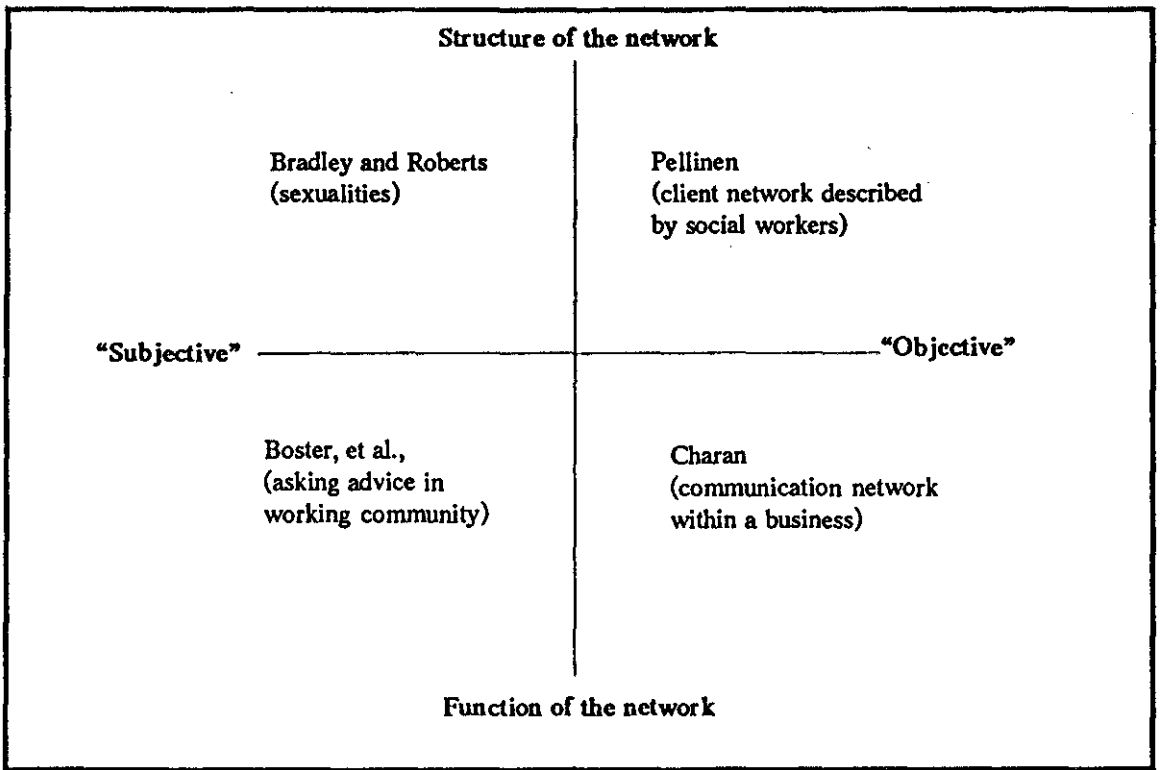


Figure 1. Dimensions and types of network descriptions

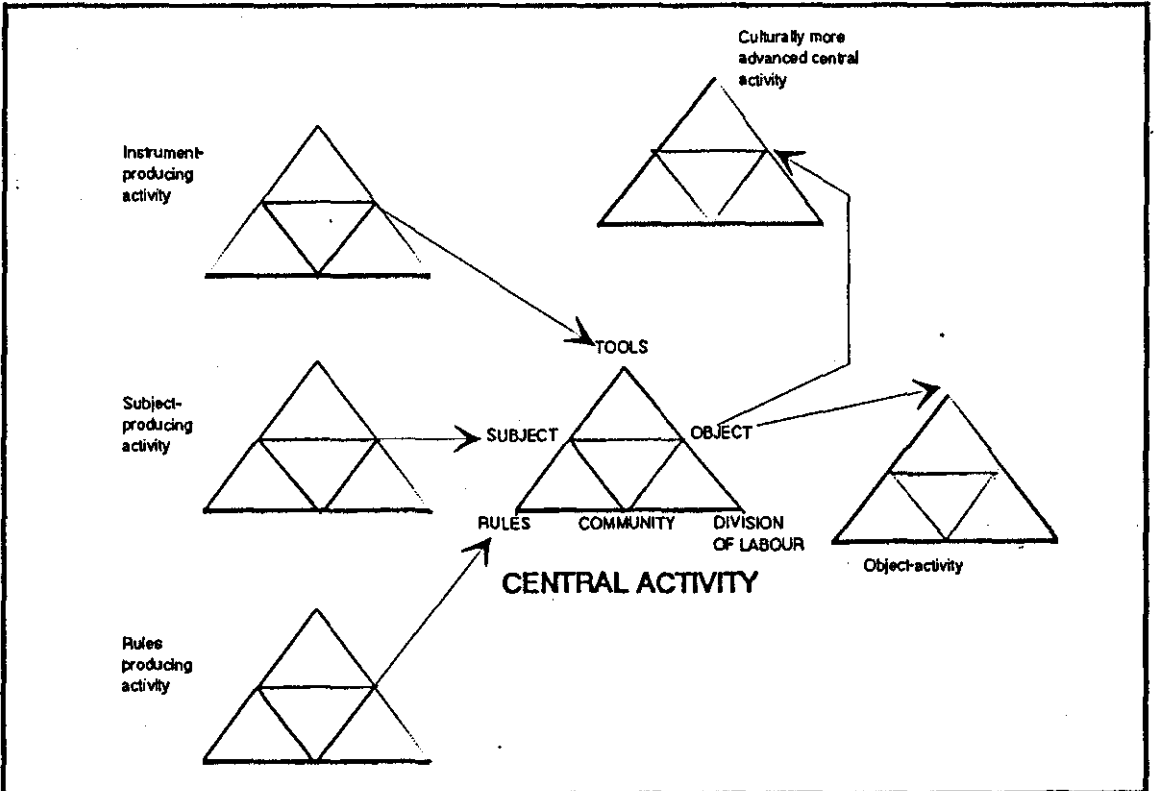


Figure 2. Idealized network of activity systems (Engeström 1987, p. 89)

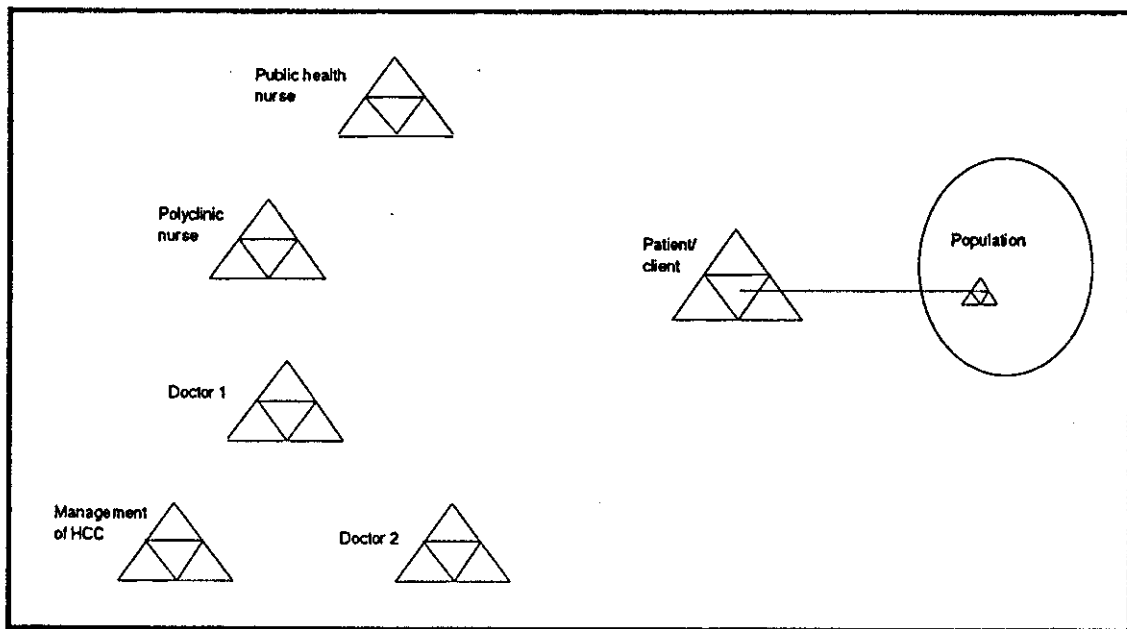


Figure 3. The basic elements of the health center practitioners' network

transferred from one worker to another. The fourth type was collaboration, where the other worker is consulted and the problem is negotiated, but still handled by the initiator of the consultation.

These subjective concepts of links were drawn on the "objective map" of the network which was constructed on the basis of ethnographic findings and the "official structure" of the health center. The networks of the public health nurse in maternity care, polyclinic nurse, and two doctors were included because they represent the most central activities in the health center. The network descriptions thus formed are presented in Figures 4 to 7.

The description of the public health nurse's network is based on five links that she describes in her interview. She is first asked about the client:

Interviewer: What about the client? What information the client needs to manage her situation?

PH Nurse: Well, she is very interested about what has happened and where we are going. Well, she gets all the information on her own card. She gets her maternity card and then we go it through and I write it down and say that here is this and here is this.

Here the public health nurse sees herself producing tools of self understanding to the client. This is marked in the Figure 4 by arrow 1. When asked about her goals the

public health nurse starts to describe what actually produces her goals:

Interviewer: Have you felt that you have achieved your goals in your work ?

PH Nurse: Yes I have. And it is really very carefully defined (which patients are referred) to maternity clinic. These referrals are defined so in detail that the central hospital has sent directives with numerous points, about whom to refer and in which kinds of cases.

The goals appear very much as rules. They are set by the maternity clinic of the central hospital, to which the object of the work can be transferred when difficulties arise. The public health nurse has three kinds of links to the maternity hospital. She herself produces objects of work at the hospital by referring patients. She actually sees this referring as the main goal of her work but it is heavily regulated by the hospital. Still, the hospital produces also tools by providing the public health nurse with feedback about the referrals (links 2,3,4):

Interviewer: Are there any [problems] in the information flow ?

PH Nurse: I have never run into [problems] in the information flow (I: Yes) It comes really well. If I, for example, refer to the maternity polyclinic I always get the records and everything.

The only connection to other health center workers is mentioned as a possibility to ask advice from Doctor 2, who is responsible for the maternity clinic of the health center (link 5):

Interviewer: In what kind of cases you consider that the client might not need your help?

PH Nurse: Well, those which as medical cases exceed my ability that they need a doctor. Those cases I refer to the health center doctor or to a specialist.

The polyclinic nurse has a large number of connections (Figure 5). They are mainly links which arise from her handling of the objects of work: patients and medical records. She refers patients to doctors and public health nurses and organizes connections for patients to the social worker and to home care. She also provides physicians with tools (medical records and instruments). By giving advice to patients she helps them to manage their problems. The activity of doctors is seen by her as rules:

Interviewer: Does your work have rules, according to which you have to work ?

Polyclinic Nurse: Of course, consultation work of doctors defines the pace and program and rules, what to do, but otherwise no... Of course, in a way those are the rules, what to do and how it is done.

Workers in the patient office which is responsible for the clerical work in the polyclinic are the only people in the health care center who are seen by the polyclinic nurse as a co-worker in a sense of doing something together. Personnel in the office and nurses in the polyclinic are jointly responsible for answering the telephone during rush hours.

The network of Doctor 1 (Figure 6) has the feature of knowingly producing tools for his co-workers. The doctor tells in detail how he reads a lot and then brings this information as photocopies or otherwise to other workers. He also describes his relations to specialist care and takes the specialist as a partner, not a rule or authority. The management of the health center, which is rarely noted in the interviews, is seen by Doctor 1 as a target of developmental initiatives produced by the doctor himself, not a producer of rules and tools. Actually, when the doctor saw the initial sketches of his network drawn by the researcher, he commented:

Doctor 1: I think, generally, on that map, the management of the health center is a very small triangle. I would draw it very minimal. I don't find it very big or

important. On the other hand, one can think, maybe the management is myself. I think the work is very independent and management means that one himself is responsible for everything.

Doctor 1 sees himself in the center of the activity managing his own work and being active towards his co-workers. Still, what he gets back is rules, displaying a certain level of annoyance:

Interviewer: What kind of negative sides [there are in your work] ?

Doctor 1: A negative side is that you are in a hurry and feel that you are not the master of your work. Usually you feel that someone rules your work and chooses the patients. Someone else is making your daily schedule, how much time you can allocate to each patient, and you have to run with the clock.

In this health care center the "someone else" are nurses in the polyclinic, as is explained later:

Doctor 1: In principle the spirit in our health center is that you can yourself say how many [patients] you see. But somehow I feel that I can't rule it myself, but someone else is doing the schedule. (...) It can be the nursing assistant, auxiliary nurse or nurse whom you are working with.

The subjective network of Doctor 2 (Figure 7) seems to be an "exception to the rule." She sees herself working together with other physicians and also with the polyclinic nurse and public health nurse. She even wanted to emphasize the collaboration while commenting on the first draft of her network description, drawn on the basis the first interview:

Doctor 2: In reality there are more of those bi-directional arrows. An arrow to the public health nurse is totally lacking. (...) We are in so close collaboration. And I think it really is collaboration, not just consultation. So that I would like to add to this.

Doctor 2 also describes more connections between other nodes in the network. A link between the polyclinic nurse and the public health nurse is described in the interview as well as a notion of these practitioners producing tools to clients.

The Object and Outcome of Work

The object and outcome of the work are seen quite differently by the practitioners. The public health nurse

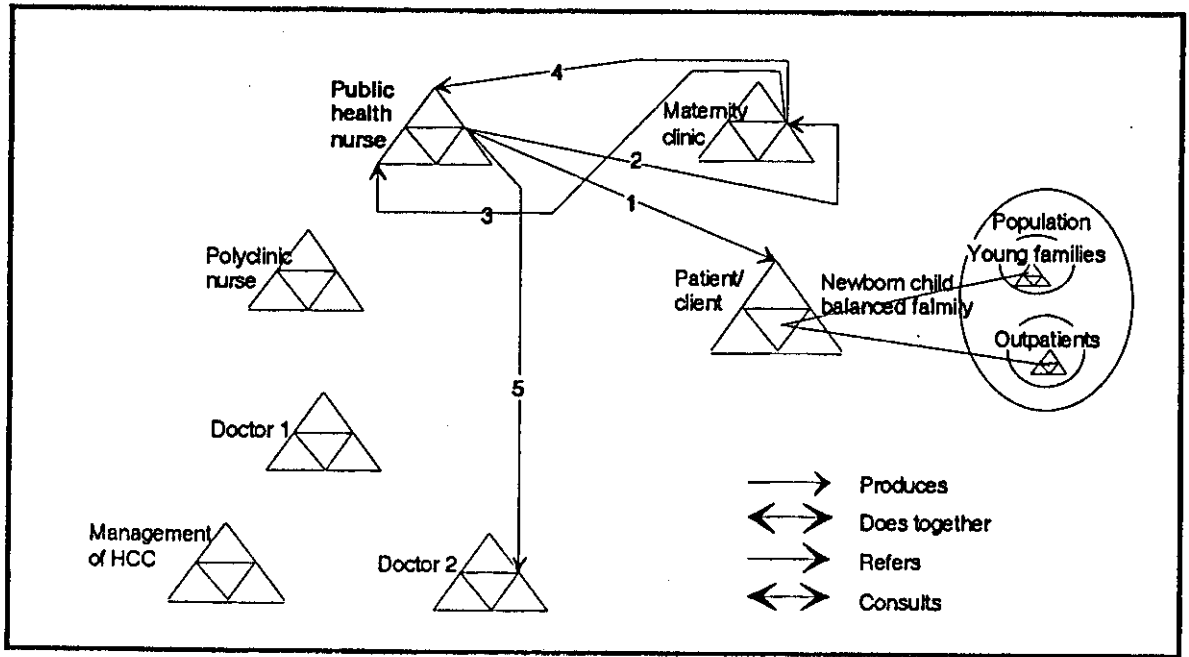


Figure 4. Network description of the public health nurse

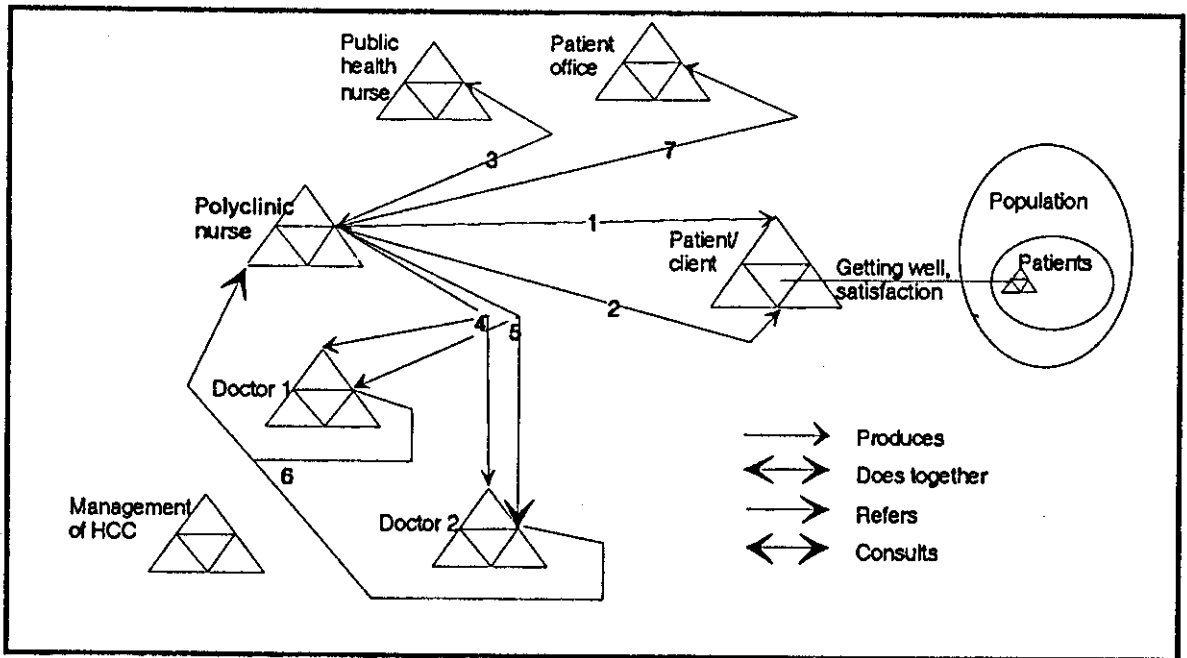


Figure 5. Network description of the polyclinic nurse

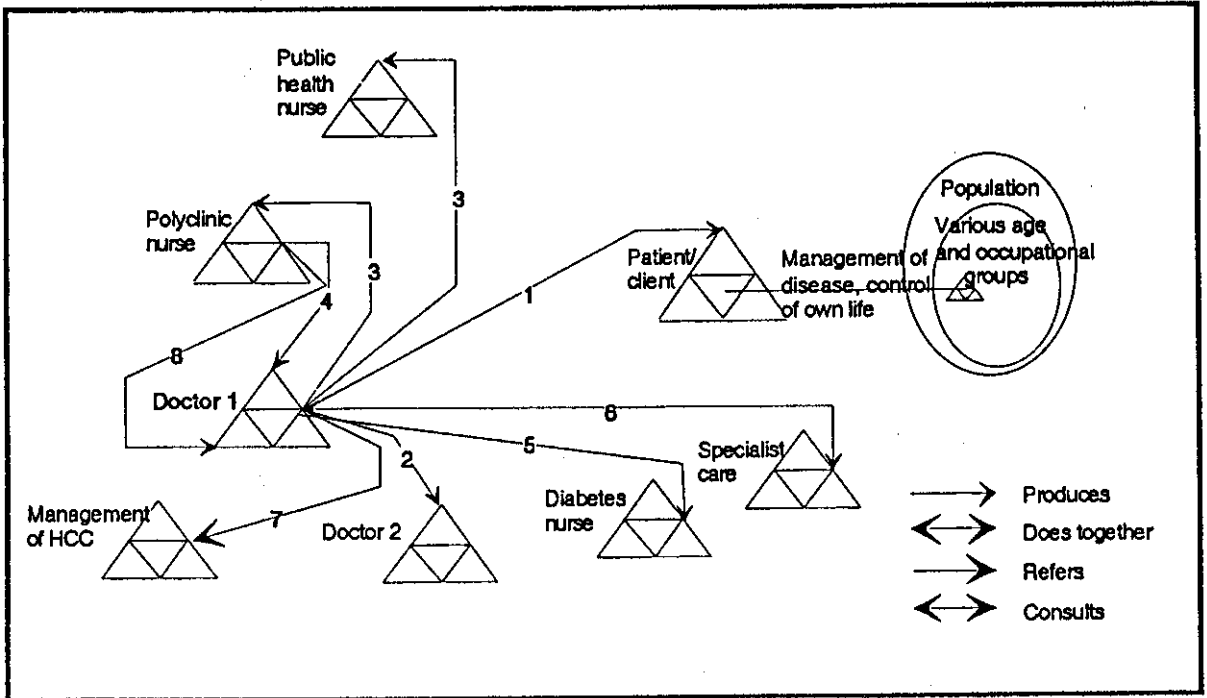


Figure 6. Network description of Doctor 1

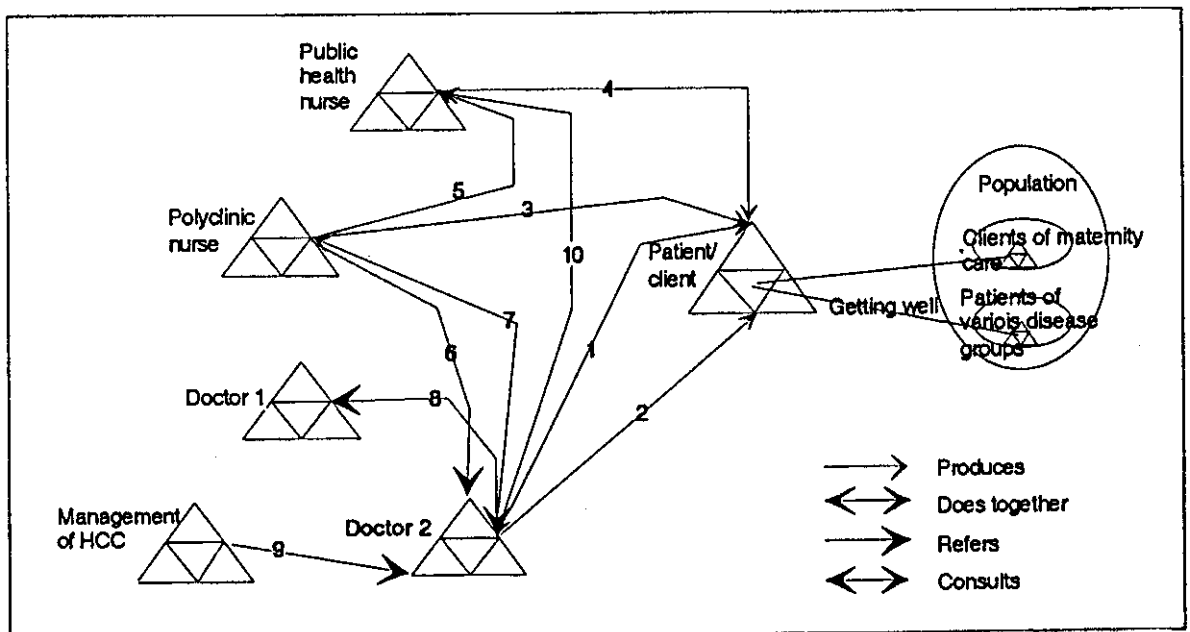


Figure 7. Network description of Doctor 2

sees mainly pregnant mothers and new families as her object but also, in quite general terms, the patients of "morning office hours." These patients can have any kind of problem, usually blood pressure measurements and removal of stitches.

Doctor 1 has a quite detailed concept of his patients coming from various age and disease groups. He sees the outcome of his work as an enhanced mastery of life by the people. The polyclinic nurse and Doctor 2 have almost similar views of their patients and the desired outcome. Both see patients as representatives of various disease groups and the outcome of the work is the healing of patients. It is interesting to see that one of these two is the only one who sees another worker as a collaborator.

Group of Workers or a Team?

The four practitioners analyzed above are responsible for key activities of the health center. They deal with the same population and even the same persons. But they see them from different angles, as is shown in their concepts of the object of the work. It also seems that interactions and collaboration are very rare. Everyone takes care of their own duties. The overall lack of collaboration is also sensed by the practitioners themselves. As Doctor 1 expresses in his interview:

Interviewer: In what kind of situations do you collaborate with your colleagues or other personnel?

Doctor 1: I would say that it is too rare. It's unfortunate that we have so little collaboration. We are there as individuals. We bustle about. Everyone of us has his or her own jobs and hurries. (...) Really, we are not working as a team. As a physician I am supposed to make the decisions. I have no other physician to help, who would say his opinion, or that we could make plans jointly.

The individualist "bustling about" makes the point quite well. Still, there are important buds of a new kind of collaboration, described by Doctor 2:

Doctor 2: Well, with the [polyclinic] nurse and the auxiliary nurse we do collaborate all the time. It is very concrete to run the polyclinic. On the other hand, they are needed to assist in the operations. But with colleagues, we look at x-ray photos together and consider appropriate medications and this kind of everyday routine. (...) Of course, I think it is very important, because I have been a very short time in this

place. There are polyclinic nurses who have been here all their lives. So I get information, as the nurse can say that this patient's husband was that one, who visited you then and then. So I get an overall view of that family.

The same kind of collaboration which for Doctor 1 is desirable but lacking is by seen as "everyday routines by Doctor 2. A bud of working together is also seen in the interview by the polyclinic nurse:

Interviewer: Do you make any care plans? What kind?

Polyclinic Nurse: Well, of course, there is a care plan which is made when the patient has first visited the doctor and the doctor has ordered a daily treatment. So then [we] continue according to that. Then always we show [the patient] to the doctor, when we think there is a need, if it has gotten worse. Of course, the doctor orders, say, a new visit after three weeks and until that a daily change [of bandages]. But, of course, we show earlier, if we think it's needed.

Here the actual care plan is made by the doctor alone but the nurse feels that her opinions regarding the course of treatment are needed to reshape it.

It is not possible to draw from this material the conclusion that this group of practitioners is working as a team with a joint object of the work and established joint forms of handling the object. Rather, it can be seen that their concepts about themselves and each other as actors in the working community form a mixture of different practices and different levels of collaboration.

The Learning Process - A Dialogue

Parallel to the network analysis, the project group formed in the health center carried out a historical analysis of the development of the health center. This analysis helped to identify the present contradictions of the health center work and build the hypothesis of the zone of proximal development (Engeström, 1987, pp. 169-175). An example of the contradictions in the work of the health center physician and the hypothesis of the development of the work is shown in Figure 8.

The historical analysis of the work shows contradictions which need new solutions. These are sketched in the hypothetical model of the zone of proximal development. Main points include working in multi-professional teams with a joint object (a geographical area with its population), joint tools, and lowering of professional barriers.

The new working model has to be formulated and learned. This development is a process, where practitioners in the health center use historical analysis and material from everyday practice to find new solutions and a model for the new practice. Engeström (1992, p. 4) has described this process by the following illustration:

The practitioners reflect their everyday practice and use intermediate instruments to give "flesh and bones" to the hypothetical model of new practice. This way the new model for practice is formed and learned. In this case the network analysis is fed back to the health center and it serves as an intermediate instrument to reflect current practices of collaboration and to identify shoots of new practices suitable for the new model. The use of this instrument and the reflection of one's own practice is captured in a quote by the public health nurse. She was looking at the draft of network analysis and commented:

PH Nurse: When I looked at this network, and really, compared it to the polyclinic nurse's network, I got really worried. Actually, according to this interview

my most important contact is outside the house, to the maternity clinic [of the central hospital]. And that is actually very awful, but it was so at the time.

The public health nurse has used the network descriptions to compare her own working practice to others'. She also states that the practice is already changing. What new practices will develop in that process will be guided by the jointly formed hypothesis of the historical development.

The use of this kind of empirical material and analyses also enhances the dialogue in the working community. The practitioners learn to evaluate each others' practices. They also learn that their own thinking models and practices can be evaluated by others. For example, during the first interview, Doctor 2 restricted the public use of her interview to short quotes by which she could not be identified. Her permission was asked for confirmation in the second interview after reading the draft report:

Interviewer: Did I understand right that these quotes from your interview can be used, if a report -s published?

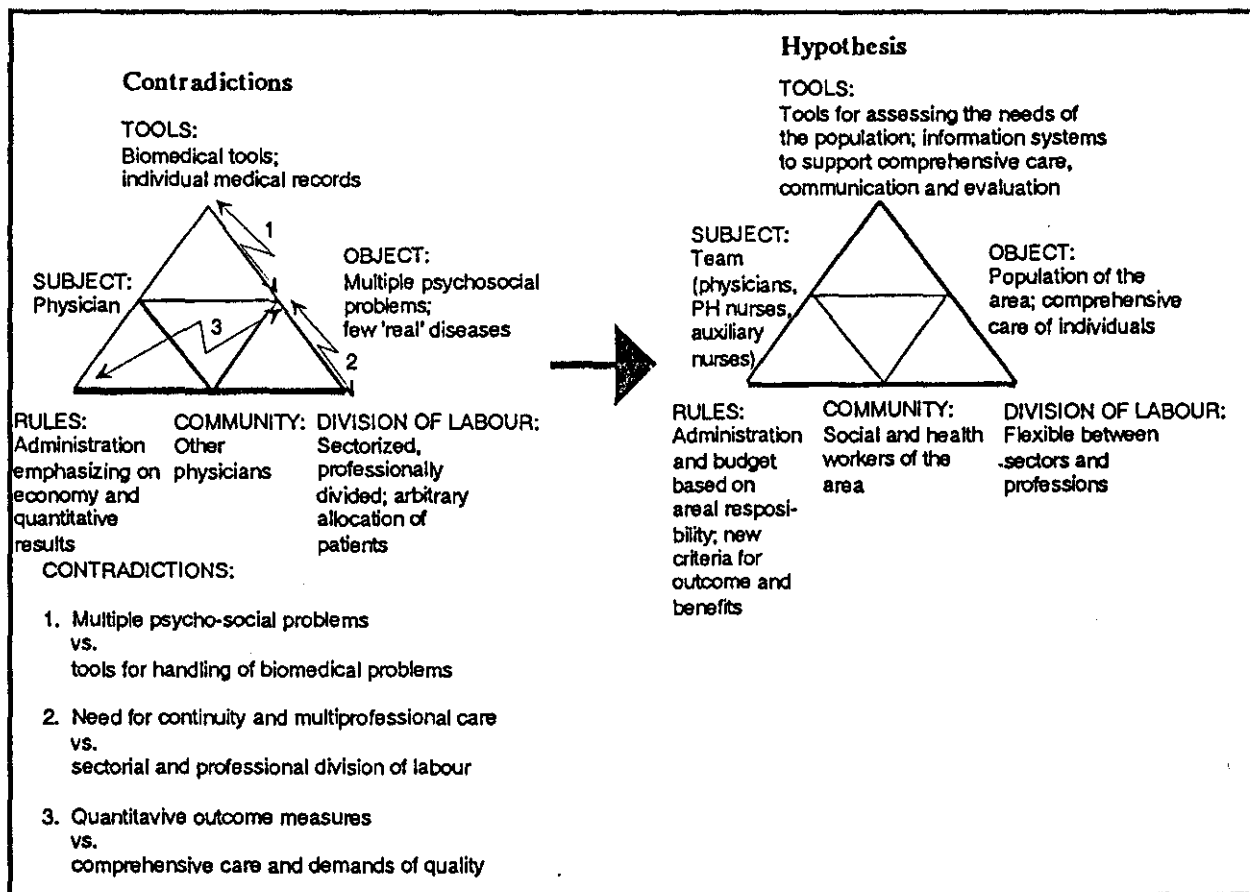


Figure 8. The contradictions in the work of the health center physician and the zone of proximal development

Doctor 2: Yes, sure they can be used. Maybe I said too strictly in the [first] interview, that it can't be used. Sure there is nothing of that kind [in the interview]. Even the whole interview can be used.

What actually made Doctor 2 extend her permission is not clear. Whatever the reasons were, the analysis changed the context of an intimate interview to a description of the working community.

Note

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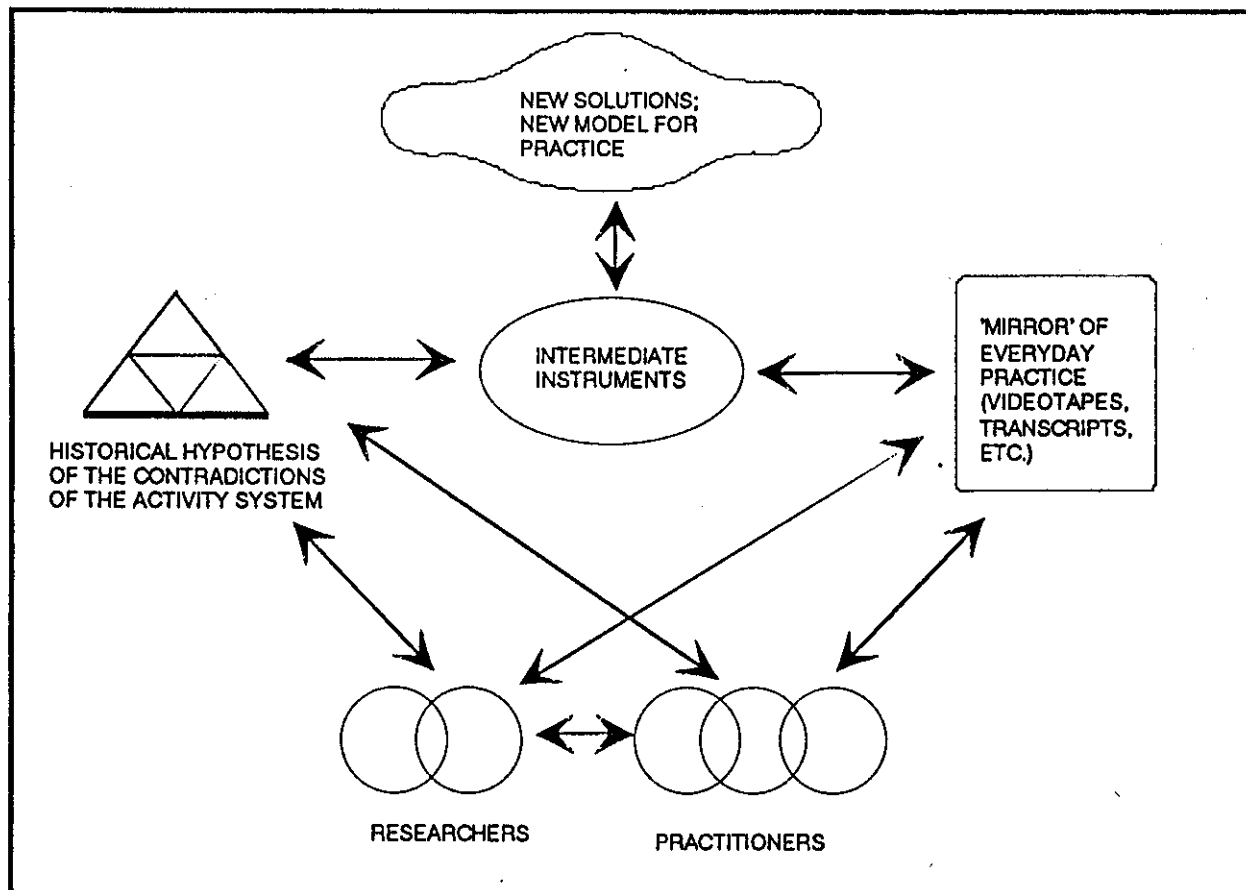


Figure 9. The structure of inquiry in developmental work research

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