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# From mediated actions to heterogenous coalitions: four generations of activity-theoretical studies of work and learning

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## ABSTRACT

The article outlines four generations of theorizing and research on work and learning within the Finnish school of activity theory. The main focus of the paper is on the evolution of the unit of analysis through the four generations, from mediated action to a collective activity system, to multiple-interconnected activity systems, and most recently to heterogenous work coalitions aimed at resolving wicked societal problems. We examine how learning and agency are conceptualized in each generation, and what kinds of interventions are conducted in the projects presented as examples of the four generations. We conclude that the four generations of activity-theoretical studies of work and learning continue to co-exist. To meet the challenges of work in today's world, activity theory must seriously engage in the development of its fourth generation, building on ideas and instruments developed by the preceding generations.

## Introduction

Work activities were not a central focus in the empirical studies of the Russian founders of cultural-historical activity theory. However, as activity theory has been adopted in western capitalist countries, studies of work have emerged as one of its main areas of application. In this article, we will examine the evolution and current challenges of these studies.

Activity theory is pursued in multiple variations around the world. Our own work has evolved within what is sometimes called the Finnish school of activity theory. Initiated in the early 1980s by an informal group, the Finnish school has developed since 1994 in the Center for Research on Activity, Development and Learning CRADLE at University of Helsinki, and since 2018 also in the RESET research group at Tampere University. This approach is known for its modelling of activity systems as prime units of analysis, for its emphasis on the object-oriented and contradiction-driven character of activity, for the theory of expansive learning, as well as for the more recent methodology of formative interventions and studies of transformative agency by double stimulation. Much of the empirical work in CRADLE has focussed on work activities under the rubric of developmental work research (DWR; see Engeström et al., 2005). More recent topics include transformations in communities and social movements, and most recently in RESET the formation of heterogenous work coalitions tackling critical societal problems and forging practical alternatives to capitalism (Sannino, 2020, *in press*).

In what follows we will trace the formation of central ideas and findings generated in the Finnish school. Obviously, other approaches within activity theory may find our ideas and arguments limited in various ways. However, rather than trying to cover all the variations of activity-theoretical research, we find it more useful to focus on our own lineage and theoretical perspective, as a contribution to further dialogue and collaborative discourse with other strands of work in activity theory and related approaches.

In the next section, we will present the notion of four generations of activity theory and the lenses we will use to discuss examples of research representing the four generations. In the subsequent sections, we will examine the four generations one at a time, focusing on one major research project as an example for each generation. We will conclude with comments on methodological challenges for activity-theoretical studies of work.

## Four generations of cultural-historical activity theory

The development of activity theory may be understood as a succession of four generations of theorizing and research. Each of the generations developed its own prime unit of analysis. The first generation was embodied in L. S. Vygotsky's work. Even though Vygotsky occasionally wrote about "systems of activity" (Vygotsky, 1997b, pp. 20–21), he did not propose or conceptualize activity as a basic unit of analysis. We agree with Zinchenko's (1985) conclusion that for Vygotsky the prime unit of analysis was that of culturally mediated action. In research on work, Scribner's (1997) studies are powerful representatives of this generation.

It was Leont'ev (1978, 1981) who worked out the second-generation unit of analysis, namely the concept of activity. Activity is a relatively durable system in which the division of labour separates different goal-oriented actions and combines them to serve a collective object. Object is what the activity is oriented toward. As the true motive of the collective activity, the object gives activity its identity and direction. The object is durable and constantly under construction; it generates a perspective for possible actions within the activity. As such, the object is not reducible to conscious goals; those are connected to discrete and relatively short-lived actions. The object of an activity is typically difficult to define for the participants. Medical practitioners may agree that the object of their work activity is health and illness, but if asked to specify the object further, each practitioner tends to give a somewhat different characterization, depending on the personal history of the individual and his or her position in the division of labour within the activity system.

An activity system is more than a mechanical sum of its components. An activity weaves together its own dynamic context, "in activity theory [...] contexts are activity systems. The subsystem associated with the subject-mediator-object relationship exists as such only in relationship to the other elements of the system. This is a thoroughly relational view of context" (Cole, 1996, p. 141).

The studies reported in the collection *Putting Activity Theory to Work* (Engeström et al., 2005) largely represent the second generation. Typically, the focus is on the analysis of a single, relatively well-bounded activity system and its transformations.

As activity systems are increasingly interconnected and interdependent, many recent studies take as their unit of analysis a constellation of two or more activity systems that have a partially shared object. Such interconnected activity systems may form a producer–client relationship, a partnership, a network, an alliance, or some other pattern of multi-activity collaboration. The formation of minimally two activity systems connected by a partially shared object may be regarded as the prime unit of analysis for third-generation activity theory.

Increasingly complex *runaway objects* with broad societal ramifications, such as climate change or pandemics, connect large numbers of activity systems across national borders (Engeström, 2009). Such objects tend to transcend the boundaries between the history of a specific activity, the history of a singular society, and the history of humankind. The emerging fourth generation of activity theory zooms on heterogenous work coalitions aimed at resolving critical societal problems, or runaway objects, and creating sustainable alternatives to capitalism (Sannino, 2017, 2020; Sannino & Engeström, 2018).

The four generations share certain foundational ideas. All of them see that work needs to be analyzed as object-oriented practice, mediated by instruments, and changing through its inherent contradictions. Work is to be understood in its constant development and transformations, making learning a central aspect of work. Transformative agency and willful action are of crucial importance

in performing and shaping work. The four generations agree that formative interventions aimed at finding new possibilities and potentials are the most appropriate way to study work.

In the following sections, we examine the four generations of activity-theoretical studies of work. Our main focus is on the evolution of the unit of analysis through the four generations. We will also pay attention to how learning and agency are conceptualized in each generation, and what kinds of interventions are conducted in the projects presented as examples of the four generations.

### The first generation: discovering historicity in work actions

An early study of the Finnish school of activity theory had focussed on the work and thinking of janitorial cleaners employed by a large commercial cleaning company (Engeström & Engeström, 1984, 1986). Their task was to clean offices and other facilities, following carefully measured time schedules and work instructions. The researchers videotaped a number of cleaners working on standard office rooms. Some of their ways of working struck the researchers as peculiar. For example, when the practitioners were asked to vacuum the floor of an office room, many of them first dragged the vacuum cleaner to the rear end of the room, then started vacuuming from there, moving clumsily backwards toward the door. When they were asked to mop the floor, many of them would move the mop on the floor as they were if washing the floor rather than moving loose dirt toward a pile with the help of the mop. When these actions were shown to the practitioners on the video, some of them were embarrassed and laughed at their own performance. When asked why they were conducting the actions in these ways, several practitioners referred to the ways they had learnt at home.

I always start from the farthest corner. At home, too. The same with mopping. So that I don't leave my own footprints there. Well, in vacuum cleaning you actually don't leave footprints, but I am used to that. At home I have a floor where even a single drop of water shows. I guess I've learned from that. [Subject 11] (Engeström & Engeström, 1986, p. 12)

The researchers interpreted these findings as evidence of layers of history actively influencing the present-day actions of the practitioners.

in the European scale, the strengthening of cleaning was obviously connected with the rise of the bourgeoisie and the protestant ethics, placing high premium on discipline, purity and order. In Finland, the first decades of [the 20th] century were a period of intensive propaganda for modern home-making and regular weekly cleaning, against the spread of diseases (especially tuberculosis) and parasites. This resulted in the breakthrough of the model of home cleaning which has persisted till today. The central idea is to clean all furniture and surfaces, especially the floors, once a week (on Saturday, nowadays on Friday) very thoroughly, with plenty of water when possible.

Now the objective basis for this model has vanished as general conditions of hygiene and medical care as well as the quality of housing have improved. Thus, we are left with the persistent *form* of the model of home cleaning, turned more or less into a ritual. The original struggle against diseases and parasites has been replaced with the objective of absolute visible cleanness and orderliness – an elusive objective that can be reached only momentarily. [...] The rules of home cleaning are those of regularity and status quo. Cleaning takes place regularly and is composed of regular components; its unspoken norm is to restore the order and appearance which have been disturbed during the week after the previous cleaning. All this has predominantly tacit, implicit character.” (Engeström & Engeström, 1986, p. 6)

In commercial cleaning, a radically different model has emerged. Wage labourers with minimal specific training perform this work. Effective floor cleaning machinery and powerful chemicals are used, and standardized written work instructions have replaced the tacit traditions of home cleaning. The object of work is now a carefully measured and normed “cleaning area”, and the outcome is an agreed-upon “appropriate level of cleanness”. The worker is a member of a centralized cleaning service. The rules are those of evening-shift wage labour. This mass-production model of cleaning has led to impressive increases in efficiency, but also to increasingly aggravated contradictions of its own.

The historical model of craft-like home cleaning influenced, sometimes dominated, the everyday actions of the cleaners working in an environment of mass production. This created a tension which the research team at the time called “the cleaner’s bad conscience”. Workers repeatedly expressed their dissatisfaction with the kind of cleanness they were able to achieve in their work. They saw their work as degenerated home cleaning. This led them to try more than was prescribed in the work instructions: more repetitions, more efforts at reaching visible ‘absolute cleanness’ in the image of weekly home cleaning. This often meant excessive stress and time pressure at work, connected to mounting health problems.

So should cleaners be taught to reject home cleaning and adapt to the norms of mass production? That would lead to submission to Taylorization and increasing pressure on the pace of work, consequences of capitalist modernization in its patronizing and oppressive sense. The researchers found it more meaningful to invite the cleaners to identify emerging new possibilities to move beyond mass production.

The example of the cleaners contains a general lesson. History is always present in human activity. Layers of historically earlier forms of the activity can be both constraints and resources. They persist in routine actions, in ways of thinking, in material artefacts and in rules. If one tries to understand actions without historicity, consequential phenomena such as the cleaners’ bad conscience are easily dismissed as arbitrary irrational features, even pathologies, of certain individuals or classes of people, to be eliminated or, at best, ignored.

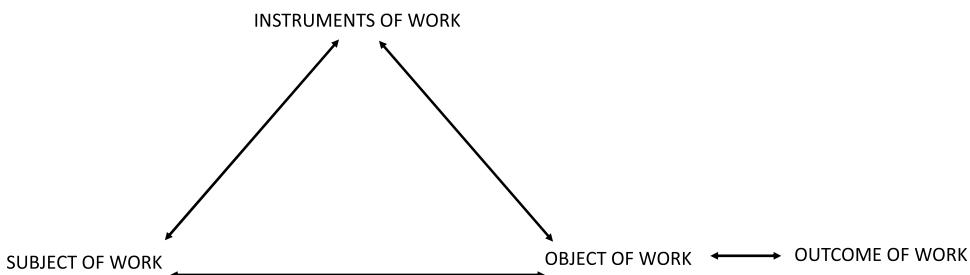
The unit of analysis in the cleaning study was *mediated work action*. The structure of such an action was represented with the help of [Figure 1](#) (Engeström & Engeström, 1984, p. 17).

Focus on work actions nourished detailed studies of actual work performances and their cognitive requirements. Variation and anomalies found in work actions opened up an avenue for a historical understanding of work.

Focus on action highlights the possibility of subjectification of the worker. The worker is seen as a subject who can design his or her own ways of performing the required actions. In the cleaning study, the model of mediated action was primarily an instrument for the researchers’ analyses. To our surprise, we found occasions in which cleaners themselves started on their own initiative to use the model to discuss their work.

An obvious limitation of action as a unit of analysis is that it does not explicitly address the social relations and organizational embeddedness of work actions. In other words, it runs the risk of locating explanations for disturbances and problems as well as innovations and emancipation in work exclusively in the individual worker.

In the cleaning study, learning was analyzed with the help of Norman’s (1982) framework of three types of learning: accretion, structuring, and tuning. This framework works well when one examines the internalization of well-defined skills, such as the standard actions of cleaning work. The framework may not be very useful if one analyzes workers’ efforts to transform their work and to generate qualitatively new actions (Engeström & Sannino, 2012).



**Figure 1.** Mediated work action as a first-generation unit of analysis in the cleaning study (Engeström & Engeström, 1984, p. 17).

In the cleaning study, workers' cognitive orientations to work were seen as the key to the agency. It was assumed that if workers understood the historically evolving nature of their work actions, including the contradictions behind troublesome experiences such as the cleaner's bad conscience, they would be able and willing to move forward, beyond the restrictive orientations of both home cleaning and rationalized cleaning.

The intervention conducted in the project consisted of a three-day training course aimed at teaching the cleaners to analyze and design their own cleaning actions. The new orientation was built on an expanded notion of the object, based on conscious integration of three requirements: healthiness or hygiene, functionality and economy, and visible cleanness (Engeström & Engeström, 1986). Three months after the course, critical work actions of the cleaners who participated in the course were significantly more in line with the new orientation than those of a comparison group (Engeström, 1995, pp. 167–168).

### **The second generation: tracing contradictions and expansive possibilities in systems of work activity**

In the early 1990s, a large project on the work of municipal courts and their judges were carried out by researchers of the Finnish school of activity theory (Engeström, 1995, 1996; Engeström et al., 1991, 1992; Haavisto, 2002). This project is an example of the second generation of activity theory at work.

The project was aimed at helping two pilot courts to implement locally the general guidelines of a nationwide court reform that would be legally enforced in all courts a few years later. Implementation was understood as a process of experimentation, innovation and learning (Pressman & Wildavsky, 1984). The researchers followed, recorded and analyzed trials before the reform and subsequently also after the reform. In particular, the researchers tried to identify and cultivate creative innovations devised and used by judges in anticipation of the full-scale reform.

The court proceedings in Finland were traditionally very formal and non-interactive, based on lengthy written briefs read aloud in front of the judge. At the same time, the judges traditionally left it to the attorneys to decide what issues to cover and how long to continue with the exchange of briefs. In other words, the old proceedings were both formal and unrestricted. This often meant multiple hearings in a single court case, extended over a period of several months. The new legislation aimed at proceedings based on informal oral discussion actively controlled and guided by the presiding judge. This should lead to a compact process in which all points of view come to light in one and the same hearing. This transformation was intertwined with a transition from the traditional notion of justice as material truth to the idea of negotiated justice and pragmatic compromise.

A crucial aspect of second-generation studies is an analysis of the historically formed contradictions in the work activity. This requires that the unit of analysis is expanded to encompass the entire collective activity system. The generic structure of an activity system was modelled by Engeström (1987, p. 78, 2015, p. 61). In second-generation studies, the model of the activity system is commonly used interactively between the researcher-interventionists and the practitioners to analyze the past, present and future of the activity.

In the model, the subject refers to the individual or subgroup whose position and point of view are chosen as the perspective of the analysis. Object refers to the raw material or problem space at which the activity is directed. The object is turned into outcomes with the help of instruments, that is, tools and signs. The community comprises the individuals and subgroups who share the same general object. Division of labour refers to horizontal division of tasks and vertical division of power and status. Rules refer to the explicit and implicit regulations, norms, conventions and standards that constrain actions within the activity system.

The object of the activity is an invitation to interpretation, personal sense making and societal transformation. One needs to distinguish between the generalized object of the historically evolving activity system and the specific object as it appears to a particular subject, at a given

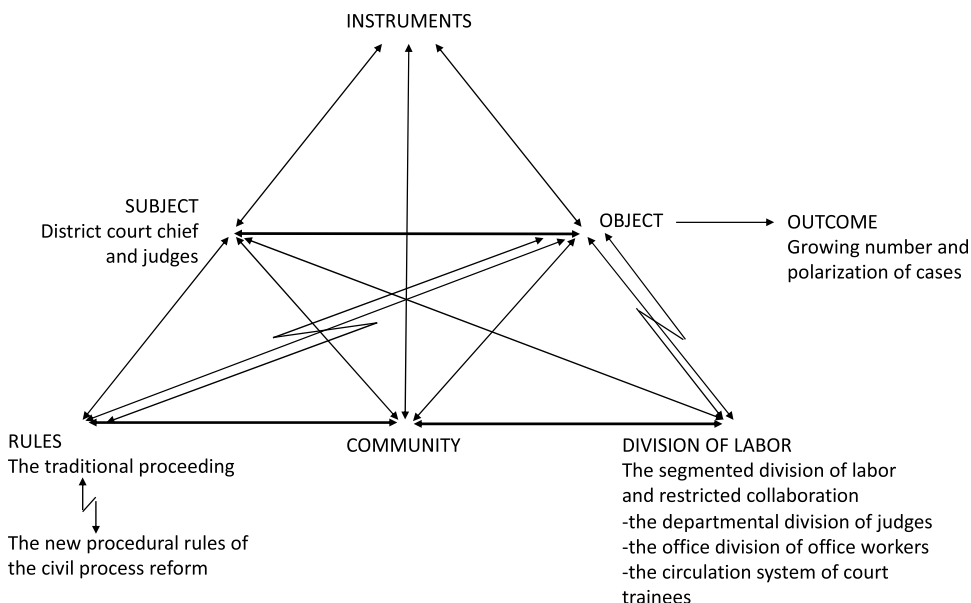
moment, in a given action. The generalized object is connected to societal meaning, the specific object is connected to personal sense (Leont'ev, 1978).

The analysis of the activity system of one of the courts, Vantaa District Court, led to the representation in [Figure 2](#). Systemic contradictions in the activity are depicted with the help of lightning-shaped double-headed arrows. There was a polarization of court cases: both the number of simple routine cases and the number of complicated cases were increasing and overshadowing the “ordinary cases”. The growing number of cases connected to business life meant more demanding and complicated issues. The judges also told in their interviews of pressures to make fast decisions and to produce more grounded justifications for their judgments.

Despite this transformation in the object of the court, the rules guiding the proceedings remained the same. The contradiction between the rules and the object was expressed in prolonged court processes, where numerous postponements compelled the judge to return to a case several times. This fragmentation diminished the judges' possibilities to master the proceedings, and compromised the quality of decision-making. This mechanism produced excessive workload and stress experienced by the judges, sometimes leading to serious health issues and even decisions to leave the court for less burdensome forms of legal work. The rules were also internally contradictory: alongside with the vestiges of the old established practice, there were pressures to take into account the forthcoming norms of the new legislation, especially the active role to be taken by the judge in the courtroom.

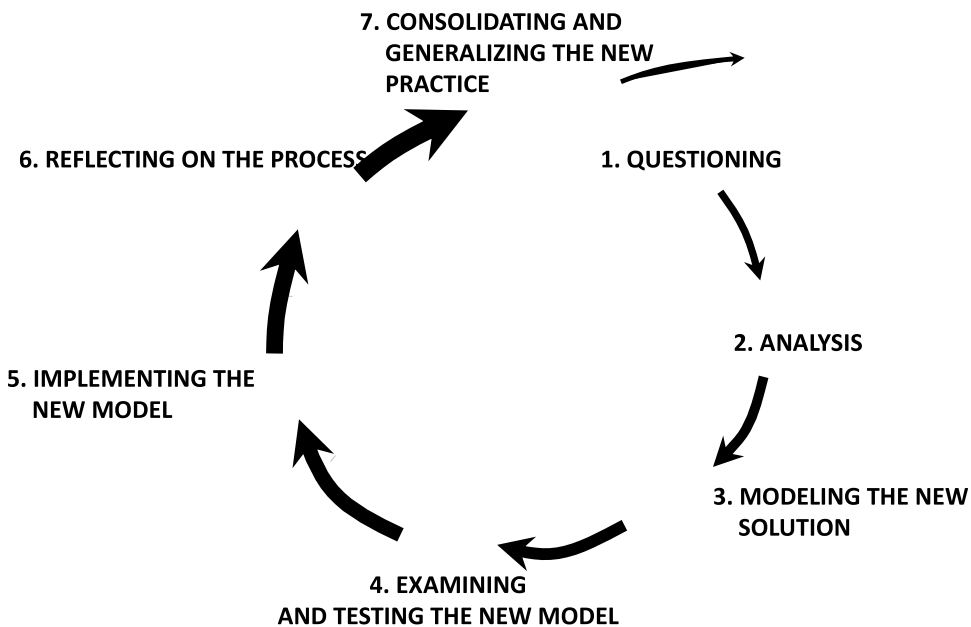
Another basic contradiction in the court activity appeared between the changing object of the work and the rigidly segmented division of labour. The judges were located in their departments, the office personnel in their offices, and the court trainees, who still provided an important labour resource, were scattered around different departments and offices. The potential for collaboration among different personnel groups was not efficiently exploited. The long-established historical tradition of the judge working alone was evident: the judges in Vantaa District Court appeared to be individual judges working alone on cases allocated to them.

In the courts project, the concept and model of expansive learning (Engeström, 1987; Engeström & Sannino, 2010) was systematically used. Learning was now understood as a collective process of creating and acquiring something that is not yet there. An expansive learning process proceeds from



**Figure 2.** The activity system of Vantaa District Court and its contradictions in 1990 as a second-generation unit of analysis in the court study (Engeström et al., 1992, p. 154).





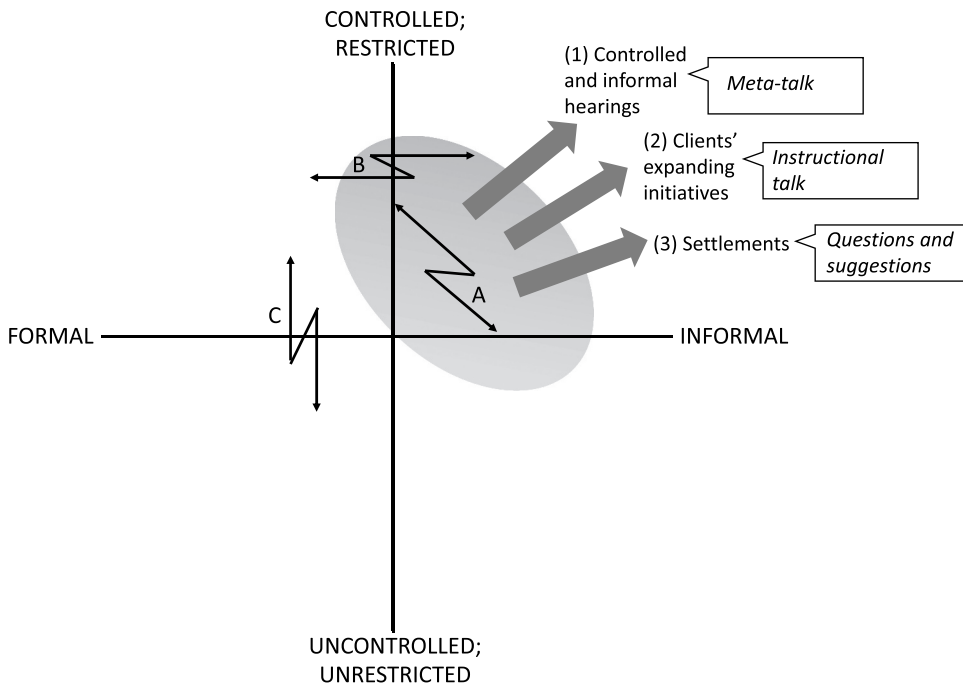
**Figure 3.** The cycle of expansive learning (Engeström & Sannino, 2010, p. 8).

questioning the existing practice to analyzing it, then to modelling, examining and implementing a new solution (Figure 3).

To transcend or resolve the contradictions depicted in Figure 2, Haavisto (2002) traced the possibilities of expansive learning in trials conducted in the Vantaa court. She identified incremental innovations, or “spearheads of transformation,” generated by a number of judges (Figure 4). These included trials in which the clients (not just attorneys) began to take active initiatives, and proceedings in which the judges intervened actively to promote settlements between the parties. In these spearheads, new ways of talking emerged, such as instructional talk of the judge directed at lay clients taking initiatives in the hearing. At the same time, new tensions also emerged with the spearheads, such as a tension between increased client initiatives made possible by the informality and the increased emphasis on active control and leadership on the part of the judge (arrow A in Figure 4). Arrow B in Figure 4 represents a tension between the intrinsically formal character of the talk of legal professionals and the informal character of the talk of lay clients. Arrow C represents a tension between controlled/restricted and uncontrolled/unrestricted discourse in the hearings, inherent in the alternative logics that were used to legitimate the new proceedings: “the first one assumes that the truth will emerge in free and unlimited communication, the second that it will evolve in communication that is regulated and rationalized by procedures” (Haavisto, 2002, p. 295).

Whereas the intervention in the cleaning study took the shape of a short and rather straightforward training course, in the courts project the intervention was multi-faceted and lasted 3 years. The researchers conducted a series of workshops in each court, inviting the practitioners to analyze and redesign their work activity. For example, in the Vantaa court, five multi-professional planning groups were formed, with the task of designing different aspects of a new overall working model for the court. The first one of the planning groups was responsible for designing a new organization for the court. The group met 18 times, including one meeting organized for the entire personnel of the court to discuss the group’s provisional proposals. Like many of the interventions in second-generation studies, this process contained various complementary learning events and sequences. Some of them were formal training sessions organized by the researchers, others were more informal design





**Figure 4.** Expansive spearheads in the zone of proximal development of court work (Haavisto, 2002, p. 298).

workshops led by judges who took the initiative to promote peer learning (Engeström, 1995; Haavisto, 2002).

In the second generation of activity theory, the agency was mainly an implicit notion, understood as expansive movement from isolated individual subjects engaged in their specific work tasks toward collaborative and collective subjects engaged in transforming the entire work activity. This movement is driven by recurring disturbances and troubles generated by historically accumulated inner contradictions in the activity system. Power becomes something that can be generated from below, by grasping the contradictions and by re-forging the activity to transcend the contradictions. Individuals gain agency and power by joining their efforts and constructing what Leont'ev characterized as “motive-goals”, referring to a merger of conscious goals of individual actions and the motive of the entire collective activity: “(...) a different fate is created when the principal motive-goal is elevated to a truly human level and does not weaken man but merges his life with the life of people, with their good” (Leont'ev, 1978, p. 134). This implies re-orchestration of social relations at work, creation of generative microcosms of collaboration and design of alternative futures.

### The third generation: negotiated knotworking among multiple activity systems

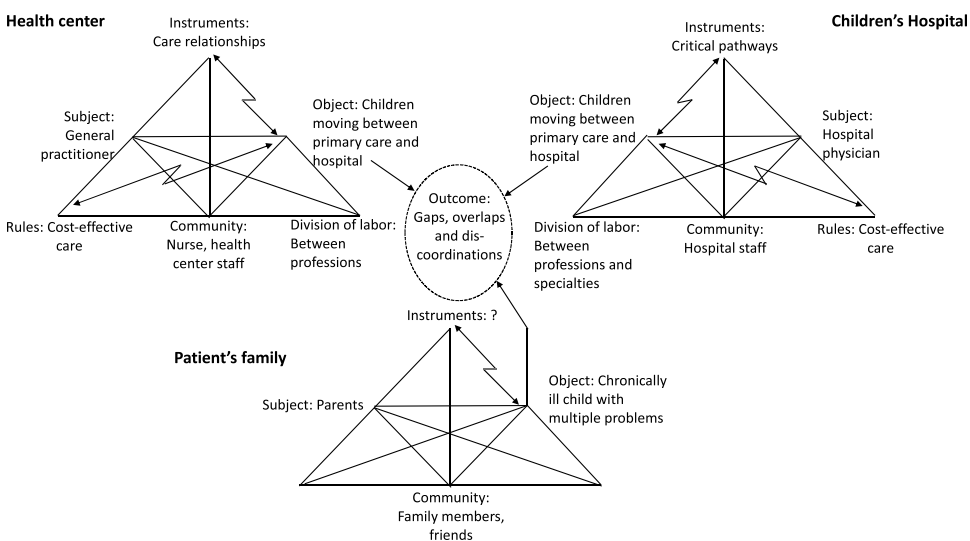
Discontinuity and fragmentation of care is a critical issue in hospital work, especially in care for patients with multiple chronic illnesses. In the late 1990s, researchers of the Finnish school of activity theory were invited to conduct a project hosted by the Children's Hospital in Helsinki, aimed at improving the coordination and continuity of care for children with chronic illnesses. The problem was particularly acute among children with multiple or unclear diagnoses. Such children often drifted between caregiver organizations without anyone having an overview and overall responsibility of the child's care trajectory. This put a heavy burden on the families (Engeström, 2001).

The Children's Hospital study was a formative intervention project which used a version of the Change Laboratory method (Engeström et al., 1996), called Boundary Crossing Laboratory.<sup>1</sup>

Approximately 60 invited representatives of physicians, nurses, other staff, and management from primary care health centres and hospitals responsible for children's health care in the Helsinki area met in 10 three-hour sessions, the last one of which was held in mid-February 1998. The participants viewed and discussed a series of patient cases videotaped by the researchers. The cases demonstrated in various ways troubles caused by lack of coordination and communication between the different care providers in the area. The troubles took the form of excessive numbers of visits, unclear loci of responsibility, and failure to inform other involved care providers, including the patient's family, of the practitioner's diagnoses, actions and plans. The learning challenge in this setting was to acquire a new way of working in which parents and practitioners from different caregiver organizations would collaboratively plan and monitor the child's trajectory of care, taking joint responsibility for its overall progress. There was no readily available model that would solve the problems.

In the multi-organizational field of children's medical care in Helsinki, there was no unit that could conceivably be the centre of coordination. In each individual patient case, the combination of institutions, specialties and practitioners involved in the delivery of care was different, and it was seldom possible to name a stable locus of control: the centre did not hold (Engeström et al., 1999). We realized that if we wanted to successfully engage the various actors involved in the care, we had to touch and trigger some internal tensions and dynamics in their respective activity systems, dynamics that could energize a serious transformation effort on their part.

A minimal constellation and unit of analysis, in this case, included the activity system of the Children's Hospital, the activity system of a primary care health centre, and the activity system of the child's family (Figure 5). In each particular patient case, the relationships of the three activity systems were different. Yet, the general structural characteristics and network positions of each one of them remained sufficiently stable to allow analysis and redesign. In the Boundary Crossing Laboratory, the basic constellation of the three activity systems was implemented so that hospital practitioners sat on one side of the room and primary care health centre practitioners sat on another side of the room. The voices of patients' families came from the front of the room, from videotapes made by following patients through their hospital and health centre visits and also from actual parents we invited to join in the sessions. Much like in second-generation studies, models such as the one depicted in Figure 5 are typically used in intervention sessions as instruments of joint analysis and design.



**Figure 5.** A constellation of activity systems and their contradictions as a third-generation unit of analysis in the Children's Hospital study (Engeström, 2001, p. 145).

In both the hospital and the health centre, there was a contradiction between the increasingly important object of patients moving between primary care and hospital care and the rule of cost-efficiency. In Helsinki, the per capita expenditure on health care was clearly above national averages, largely due to the excessive use and high cost of services provided by the central university hospital of which the Children's Hospital is a part. Thus, there was a tension between the primary care health centre and the university hospital. Health centres in the Helsinki area were blaming the university hospital for high costs, while the university hospital criticized health centres for excessive referrals and for not being able to take care of patients who did not necessarily need hospital care.

A contradiction also emerged between the new object (patients moving between primary care and hospital care) and the recently established instruments, namely care relationships in primary care and critical paths in hospital work. Being linear-temporal and mainly focused on care inside the institution, these instruments were inadequate for dealing with patients who had multiple simultaneous problems and parallel contacts to different institutions of care. In the activity system of the patient's family, there was also a contradiction between the complex object of a child's multiple illnesses and the largely unavailable or unknown tools for mastering the object.

In the Boundary Crossing Laboratory, we invited the participants to face and articulate the contradictions inherent in their work activity by presenting a series of troublesome patient cases captured on videotape. In several of these cases, the patient's mother was also present. This made it virtually impossible for the participating professionals to blame the clients for the problems and added greatly to the urgency of the double bind. As different aspects of these contradictions were articulated in the Boundary Crossing Laboratory, we observed a shift among the participants from initial defensive postures toward a growing determination to do something about the situation. The determination was initially fuzzy, as if a need state (Bratus & Lishin, 1983) looking for an identifiable object and corresponding concept at which the energy could be directed.

In the fifth session of the intervention, a physician from the Children's Hospital used the expression "tying of knots" to capture the idea of a new pattern of activity needed to achieve collaborative care of children with multiple illnesses across institutional boundaries. The practitioners should be able to connect and coordinate with one another and with the parents quickly "on the spot" when needed, but also on the basis of a shared and mutually monitored long-term plan. The notion of negotiated *knotworking* (Engeström, 2008; Engeström et al., 1999) became a key to the emerging new practice and toolkit of *care agreement* that was generated by the participants (Engeström, 2018).

In third-generation studies, lateral interactions across the boundaries between participating activity systems become central. This sideways dimension of expansive learning involves the construction of new social relations by means of debate, negotiation and shared experimentation. While still chiefly an implicit notion, agency was seen to emerge through the recognition of differences and complementarities of expertise and positions. The introduction of knotworking requires that the participants acknowledge that the centre of initiative, control and power is not stable. When the centre does not hold, the knots of collaboration must be time and again reconstructed according to the shifting needs of the object and the problem at hand. For practitioners, a transition from compartmentalized bureaucracy and mass production to knotworking and co-configuration is both a risk and a possibility.

### **The fourth generation: enacting utopias in heterogenous work coalitions**

The possibility of a fourth generation of CHAT was tentatively put forward in 2009 (Engeström, 2009; Sannino et al., 2009). It was more poignantly proposed by Sannino (2017) in a keynote address discussing the challenge of eradicating homelessness.

In a recent paper, Spinuzzi (2019) argues that as work and organizations are increasingly operating in unstable, fluid and poorly bounded arrangements, an interventionist approach of third-generation activity theory may struggle to unite different stakeholders or even to identify and stabilize one set of stakeholders. He concludes that the interventionist codesign orientation which shaped the approach and theoretical tools of third-generation activity theory may be untenable in such situations of

unstable stakeholders. Spinuzzi predicts that to cope with this challenge, activity theory will have to undergo a major qualitative transformation.

We agree with Spinuzzi on the need for a new, fourth generation of activity theory. We also agree that instability is an important challenge. However, we do not agree with the claim that the emergence of unstable stakeholders is the main challenge. To us, the main challenge that requires a fourth-generation activity theory is the radical and fateful transformation in the *objects* of human activity. In the current phase of capitalist globalization, such interconnected objects as poverty, climate change, and pandemics cannot anymore be treated as isolated issues to be brought under control by technical means; they influence and pervade the objects of innumerable activities and call for radical revisioning of the ways our societies and lives are organized.

Homelessness is an example of the type of objects that require a fourth-generation activity theory. Based on national reports, it is estimated that no less than 150 million people are homeless. Homelessness is rising in most major cities in the world. The challenge is not just the scale; it is above all the dynamics that make the eradication of homelessness look like an impossible task. The fourth generation of activity theory needs to create and implement a unit of analysis that can match the complexity and dynamics of an object such as this. In what follows we will propose such a unit of analysis.

In the fall of 2018, Sannino's research group RESET embarked on a major project aimed at supporting the design of the next phase of the Finnish national strategy to eradicate homelessness. Finland is the only European nation that has been able to significantly and consistently reduce homelessness over the past decade. At the end of 2019, there were 4600 homeless persons in the country.

Finland builds on its own version of the Housing First (HF) principle and pursues a multi-level, multi-sectoral strategy that has been implemented with the help of national policy programs since 2008. These programs have secured a supply of affordable housing and tailored services to clients with complex problems and high need of social and health care. The Housing First principle states that living in one's own apartment is a precondition for a person to be able to overcome such complex problems. Only when a person has his or her own home can one realistically expect that targeted work on addictions, debts, mental health and involvement in crimes can be successfully undertaken. Intervention research on the seemingly unsolvable problem of homelessness and on the heterogeneous and distributed strategy to eradicate it represents the currently emerging fourth generation of activity-theoretical studies of work.

As time is maturing for its development, fourth-generation activity theory should offer a unit of analysis able to grasp a qualitatively new type of activity formations and concerted efforts that can realistically counteract stigma and suffering associated with conditions of deep disadvantage. Such a new step entails the involvement of a wide variety of actors at multiple levels – local, regional, national and possibly global. Such heterogeneous activities are brought together by objects that are directly related to the future of the planet and the humankind living on it, that is, to urgent socio-economic, ecological and humanitarian crises. Activity coalitions focused on this kind of objects represent crucial sites of inquiry for conceiving a fourth-generation unit of analysis. These activities operate at different hierarchical levels in the society and represent qualitatively different types of work. They require one another to enact the shared utopia and their actors must learn to operate on the basis of concerted initiatives rather than by top-down orientations.

Spinuzzi sees the main challenge in the unstable constellations of stakeholders. In our work with the Finnish homelessness strategy, we indeed face fluctuation: some key actors leave, some organizations merge or redefine their responsibilities. Yet we also see that these shifts are promptly dealt with: replacements and new actors step in, organizations regroup to compensate for gaps. There is a reason for this resilience. The object of homelessness has generated and keeps engendering historically durable, materially grounded commitment that provides a powerful organic glue for the expanding coalition.

A unit of analysis appropriate for the fourth generation cannot be constructed simply by adding more activity systems to the third-generation unit. A twofold qualitative shift is needed. First of all, the

unit needs to be built around fateful objects that affect lives across boundaries. Secondly, we need to move from an emphasis on structural relations to an emphasis on processual relations, or from emphasis on space to an emphasis on time. Thus, fourth-generation activity theory focuses on the multiple coalescing cycles of expansive learning involved within and across the activities involved, their relatively independent dynamics and their interdependency (Figure 6).

Over the past decade, the Finnish Housing First strategy has developed through multiple interacting and overlapping learning cycles, which are situated at different hierarchical levels and are both relatively independent and interdependent. They require one another to emerge and sustain themselves. They also operate across sectors of social services (housing, substance abuse, mental health, debts, and crime) represented by the different shades of colours in the cycles in Figure 6.

The central learning cycle in Figure 6 is the one taking place among residents and frontline workers in supported housing units. These are usually recently built or newly renovated buildings with small apartments offered to homeless in great need of support. The residents have long-term or permanent rental agreements to live in these apartments. Practical nurses, social workers and registered nurses work in or visit the units to help the residents realize jointly prepared rehabilitation and other life plans. The ethos of Finnish Housing First is that everyone, no matter how complex his or her starting point might be when arriving in a supported housing unit, can learn to pay the rent, to clean the apartment and to make steps toward independent living.

The learning cycles of the housing units are directed and supported by the work of the NGOs responsible for them. The learning cycles of NGOs and housing units are in turn directed and supported by the municipal services, which in turn rely on learning taking place at the state level.

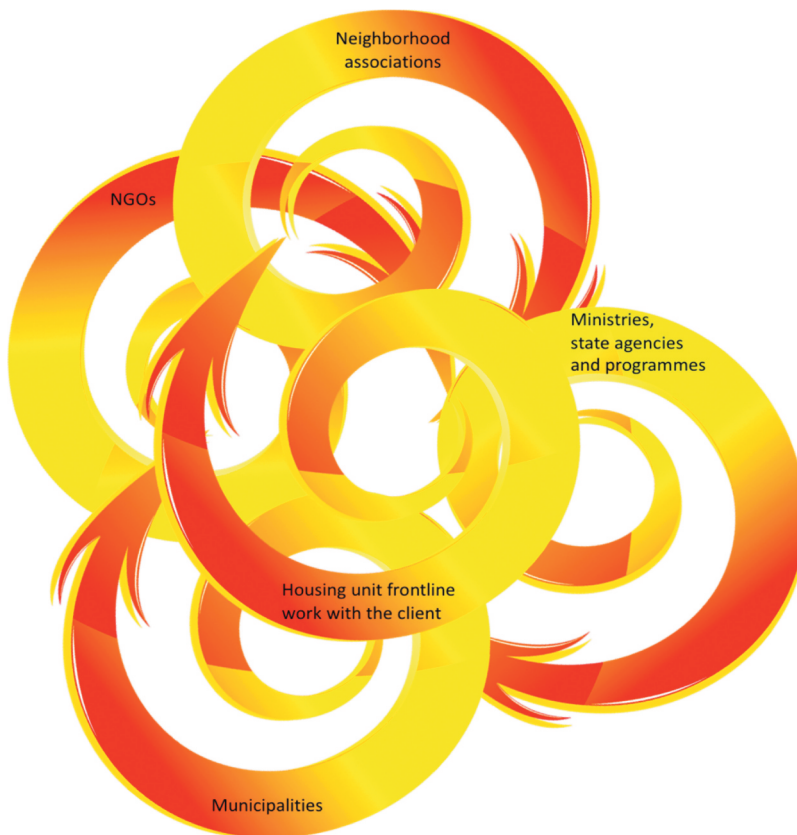


Figure 6. Coalescing cycles of expansive learning as a fourth-generation unit of analysis in the homelessness study.

At the same time, the learning taking place within the housing unit directs and support learning in the neighbourhoods. Also the work within housing units constantly feeds developments and reorientations at the NGO, municipal and national levels.

The Finnish Housing First strategy has ensured systematic nationwide development of expansive competences and knowhow, which have proven to be effective in responding to homelessness. Professionals who have been retrained over these years have developed a strong commitment to the cause of eradicating homelessness, and have been able to scale up changes at the local level toward a large, societal transformation. This is an internationally exceptional achievement, as in other countries the implementation of Housing First principles has so far only been carried out through isolated projects (Pleace et al., 2016). As such, the Finnish case stands out as a globally relevant instance of learning for the enactment of a utopia (Sannino, 2017, 2020; Wright, 2013).

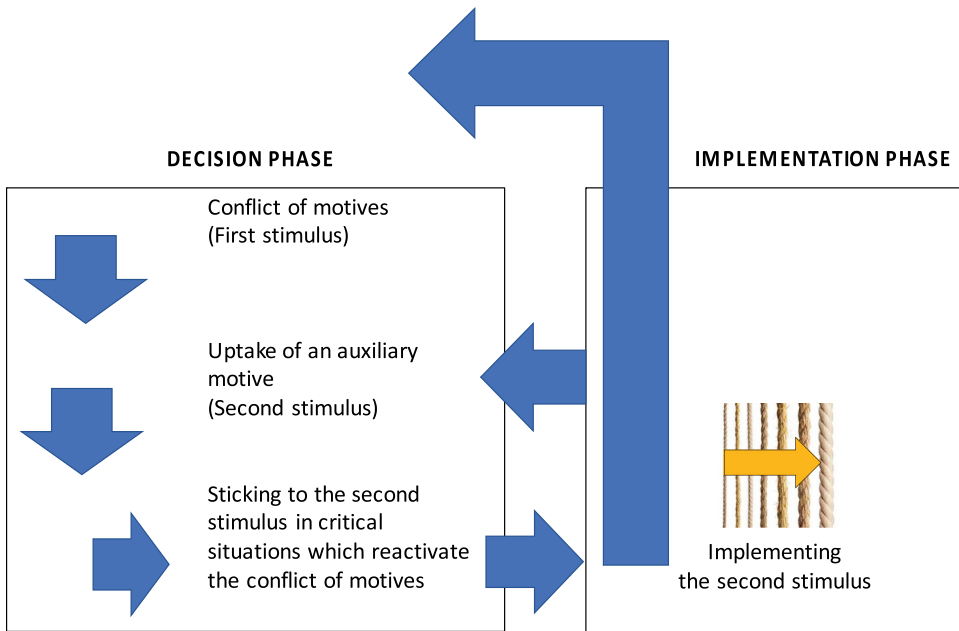
Despite its success, the strategy is vulnerable. Recently it has become evident that the strategy is not sufficiently equipped to provide differentiated solutions targeted at homelessness among specific groups such as youth, immigrants, women, and families with severe financial debts. At the same time, two main factors made the future of the Finnish Housing First strategy uncertain, namely a generation change among administrators and practitioners, and lack of political commitment to financially support a new targeted homelessness program after the end of the latest homelessness prevention program in 2019. With regard to the latter threat, the situation has significantly improved at the time of the completion of this article. The current left-centre government of Finland has in its program declared an exceptionally strong commitment to complete eradication of homelessness.

We will halve homelessness during the government term and eradicate homelessness within two government terms, in other words, by 2027. We will continue to operate according to the 'Housing First' principle, which has proved to be effective. We will focus especially on making housing advice more readily available and on preventing homelessness, particularly among young people and migrants. (Programme of Prime Minister Sanna Marin's Government, 2019, p. 58)

The new political mandate makes it clear that now it is time to design and implement the next phase of moving toward the enactment of a utopia – end to homelessness. The COVID-19 pandemic with its devastating economic and social consequences is a new threat that makes this task both urgent and extremely demanding.

The cycles in the unit of analysis (Figure 6) form dense patterns with the grounding and resilience that can withstand setbacks. Turning to a useful metaphor, they can be conceived of as a thick rope pattern (McDermott, 1980). The stronger the rope, the better expansive learning coalitions will face setbacks. How can such strong ropes and thick patterns be built? Recent developments in activity theory point at a key conceptual resource for the formation of strong expansive learning patterns: the generation of transformative agency by double stimulation (Sannino, 2015a, 2015b, 2016; Sannino et al., 2016b; Sannino & Laitinen, 2015). A general model of double stimulation is presented in Figure 7.

Originally described by Vygotsky (1997a), transformative agency by double stimulation is a process by which human beings can intentionally break out of conflicting motives and change their circumstances. The starting point of double stimulation is confrontation with a problematic situation which triggers a paralyzing conflict of motives (first stimulus). In trying to cope with the problem, learners turn to artefacts and invest them with meaning (second stimuli). They decide to rely on these artefacts when instances of the problematic situation reoccur. Each new instance of the problematic situation is cognitively and emotionally critical in that it reactivates the conflicting motives. When learners actually put into use the second stimulus, this implementation helps them to gain control of and to transform the problematic situation into one that is more understandable and manageable. The repeated implementation of the second stimuli to deal with the problem or specific aspects of it strengthens the learners' understanding of the problem and their capacity to take further actions, which in turn strengthens the longitudinal "rope" of the expansive learning process. As a result, both the problem situation and the learners are transformed.



**Figure 7.** The process of emergence of transformative agency by double stimulation (Sannino, *in press*).

The housing unit where we started our fourth-generation Change Laboratory interventions had operated under the Housing First principle since its inception in 2012. However, the staff had worked for many years acting as guards and controllers toward the residents, which led to tensions with and complaints from the residents. The consolidated mode of activity kept the staff locked up in an office space with a plexiglass window through which they could control those who entered or exited the unit. In the spring of 2018, the staff, led by a newly recruited unit manager, started a transformation process aimed at generating a new way of working with the residents. In the fall, the staff expressed an acute need for conceptual and practical support from the RESET research team in the transformation process. In other words, the way of implementing the principle of Housing First in practice needed to be radically reconceptualized.

The physical elimination of the “wall” between the workers and the residents of the unit led to great turmoil among the staff. Some of the workers were afraid of the residents, and the idea of being in an open space with them without a protective wall in between was very difficult for them to accept. At the same time, it opened up new possibilities of meaningful interaction with the residents, generating a conflict of motives. When the unit manager sat with the workers in the open space casually interacting with the residents or having oatmeal with them, a set of very practical new second stimuli, such as a bowl of oatmeal or a cup of coffee, became available to the workers (Sannino, Sannino, *in press*).

A staff member in this unit might have been torn between the conflicting motives of self-protection by sticking to the old guard-like way of approaching the residents on the one hand, and stepping into the potentially more meaningful new way of working in an open space with the residents, on the other hand, (first stimulus). One day this staff member might have decided that next time he would meet this resident of whom he is so much afraid, he will ask him if he wants to have a cup of coffee (second stimulus) as the manager had done while sitting in the open space. When the staff member meets this resident the volitional action might be implemented or might not. If the volitional action is accomplished by implementing the second stimulus, the problematic situation acquires a new meaning, becoming less paralyzing. Then by repeating over and over again the process with situated variations,



transformative agency develops to the point that the staff member discovers new capabilities he had ignored before and qualities in the resident that he had equally ignored (Sannino, *in press*).

Nobody told the staff member to have a cup of coffee with the resident. This is a volitional action taken by the staff member in response to the conflict of motives he or she is experiencing. Essentially the transformative agency process is a deliberately initiated conditioning process by an individual or a collective who resolves to learn a new way of working. This is crucially a self-designed and self-enforced conditioning (rather than a classic behavioristic one) which builds up into novel modes of action and expansive learning.

On the basis of 25 years of activity-theoretical research using Change Laboratory formative interventions (Sannino & Engeström, 2017; Sannino et al., 2016b) in which double stimulation has been systematically implemented, we have strong empirical evidence to claim that the stepwise expansive learning cycle and the transformative agency process mutually induce one another. As we embark on fourth-generation intervention studies, this connection gains new significance. The intertwined learning cycles are longer and more complex, typically riddled with obstacles and setbacks. In these conditions, the process of transformative agency by double stimulation is of critical importance for sustained expansive learning to occur and needs to be mobilized throughout the intersecting cycles of expansive learning (Sannino, 2020, *in press*).

As already indicated above, the first Change Laboratory intervention of the homelessness project was conducted with the entire staff of a housing unit that embarked on an effort to reorganize itself in 2018. This intervention is analyzed in more detail by Sannino (2020, *in press*). The unit offers supported housing for young residents, each having his or her own apartment and rental contract. It has nearly 100 apartments for a clientele that is considered the hardest to find housing for, due to criminal records, debts, substance abuse and mental health problems. Staff is present 24/7. The unit is located in a well-off, politically conservative neighbourhood and has received negative press frequently ever since its opening. In public debate, the residents are often considered as “addicts” who are deemed “everyone’s least favorite neighbors”.

In the housing unit, the staff characterized their zone of proximal development in terms of moving from “being a controller to being a coach and a fellow traveler”. Such a transition was a demanding effort as the tensions inherent in the traditional model of guarding and controlling were identified and worked out by the staff in the Change Laboratory sessions. The participants analyzed the change process they were carrying out in the housing unit, using the model of the cycle of expansive learning as their instrument for analysis. They have modelled their new way of working and defined the direction of its development. To continue the development, the participants identified 15 spearhead projects whose implementation is followed and supported. The residents largely welcomed the change as a perspective toward regaining their self-esteem and self-determination. The results of the transformation process in the unit have been rather remarkable and it has become a model for many other units in the nation aiming at similar transformations.

Two related Change Laboratories followed in 2019, one with city level actors in the city of Tampere and the other one with state-level actors. Each Change Laboratory consisted of a series of six sessions in which the research team and the participants jointly analyzed factors that hamper successful outcomes with homelessness and co-designed novel solutions. The videotaped sessions are transcribed for analyses using discourse analysis methods devised for conversations taking place in longitudinal Change Laboratory interventions (Engeström et al., 2013; Engeström & Sannino, 2011; Sannino, 2008; Sannino et al., 2016b).

With regard to the role of the participants as initiators and shapers of the new model of activity, the three CLs discussed here were similar to the CLs of earlier generations of CHAT. In the first CL conducted in the housing unit – the one already analyzed in some detail – the analysis of the current contradictions, the zone of proximal development, the new model of the activity, and the spearheads for next steps of development were all co-constructed and decided upon by the participants, with the interventionist-researchers in the role of provoking, supporting and

recording their efforts (Sannino, 2020, *in press*). There were several episodes in which the participants rejected or substantively altered suggestions coming from the researcher-interventionists.

The three Change Laboratories were intertwined in various ways. A practitioner from the local housing unit presented experiences of the first CL and answered questions at one of the city level CL sessions. One practitioner from the housing unit CL and one from the city level CL participated in the national level CL. Video clips from the housing unit CL and city level CLs were used as stimuli for joint analyses and design efforts in the national level CL's intervention sessions. The multiple ways in which the three interventions and learning cycles interacted require careful analysis which is currently underway.

The interventions at the ground level of the housing unit and at the intermediate level of the city served as impulses for modelling solutions for the challenges to be met at the national level. This cross-level and cross-sector interaction and coalition building represents a new challenge and opportunity for expansive learning at work (Sannino, 2020). Also, these intertwined Change Laboratories initiate further learning cycles aimed at establishing novel heterogeneous coalitions toward the next steps of the strategy. These dynamics demand careful studies and new intermediate conceptual tools to be developed within activity theory.

Expansive learning in this context consists of joint reconceptualization efforts by a flexibly developing coalition of diverse actors pursuing the eradication of homelessness and realization of the functional independent living of each former homeless person in a home of one's own. This is a societally contradictory and tension-filled object, due to the financial costs and required extensive transformation of mindsets, practices and material arrangements. The different actors are driven by their different partial objects; the challenge is to enable them to debate, negotiate and co-design the emerging overall object so as to reach sufficient coherence, stability and motivational force to generate determined and resilient collective activity over a lengthy period of time. Strong agentic actions of commitment and material implementation are needed to pursue such an object (Sannino, 2008, 2010). The concept of *transformative agency by double stimulation (TADS)* (Sannino, 2015a, 2020, *in press*) aptly captures this type of willful pursuit of enacting utopias for the common good.

Fourth-generation studies involve a radical expansion of social relations. Dialogue, trust and collaboration need to be built among large numbers of diverse activity systems and their actors, crossing professional, functional and administrative boundaries both horizontally and vertically. We are only beginning to develop conceptual tools and methods to analyze and foster these processes of generating dynamic social cohesion around a shared object among heterogeneous activities.

The notion of fourth-generation activity theory presented here consists of a research-based inquiry conducted in close collaboration with key operative stakeholders working for and with the homeless from the ground level of frontline work to the city level and the state level. The role played by the research team represents ways in which theoretical tools can contribute to bringing together multiple parties and serve as mediators for collaborative analyses to meet critical societal transformations. The approach may, in the long run, contribute to the establishment of globally interlinked experimental hubs across universities and their partners, focused on pressing challenges of our time.

## Conclusion

Our account of the evolution of activity-theoretical research through the four generations may be summarized with the help of [Table 1](#).

The four generations of activity-theoretical studies of work continue to co-exist. To meet the challenges of work in today's world, activity theory must seriously engage in the development of its fourth generation. But a fourth-generation study builds on ideas and instruments developed by the preceding generations. The intertwined learning cycles depicted in [Figure 6](#) are intimately connected to the interacting activity systems depicted in [Figure 5](#), and the analyst needs to move between the two.

**Table 1.** Overview of the four generations.

	First generation	Second generation	Third generation	Fourth generation
Object and problem	Challenge in individual learning or development	Collective developmental contradictions demanding on expansive solution	Developmental contradictions within and between interconnected activity systems	A critical societal challenge or crisis demanding a multi-level and cross-sectoral solution
Unit of analysis	Mediated action	Collective activity system	Minimally two interacting activity systems with a partially shared object	Coalescing cycles of expansive learning in a heterogenous coalition of activities facing a critical societal challenge
Concept of learning	Internalization of given skills and knowledge	Expansive learning cycle generating what is not yet there	Expansive learning cycle involving boundary crossing and horizontal sideways learning	Horizontal and vertical interplay between multiple coalescing cycles of expansive learning
Concept of agency	Agency as grasping the historically evolving nature and emancipatory possibilities of one's actions	Agency as expansive movement from individual subjects and their tasks toward collective subjects transforming their activity	Agency as recognition and negotiation of differences and complementarities	Transformative agency by double stimulation
Typical intervention	Training aimed at emancipatory understanding and mastery of one's actions	Longitudinal process of collective analysis and redesign of the activity → emergence of the Change Laboratory method	Change Laboratory and Boundary Crossing Laboratory	Multiple interconnected Change Laboratories, from local to municipal, regional, national and international levels – with longitudinal follow-up

Detailed studies of critical work actions pioneered by the first generation do not lose their relevance – but they need to be done in a broader perspective of the activity systems and societal challenges in which the actions are embedded.

The triangular models of the units of analysis of the first three generations have proven to be effective instruments for participatory collective analysis and design. Can the proposed fourth-generation unit of analysis (Figure 6) serve practitioners, communities and researchers in the same way? We believe it can. The first detailed analyses of the interplay of coalescing expansive cycles are in progress, and many new methodological problems need to be solved. We already have evidence that the closely related model of transformative agency by double stimulation (Figure 7) is serving well in interventions and analyses (Hopwood & Gottschalk, 2017; Jalasi, 2020; Sannino, *in press*).

From the very beginning, activity theory has prioritized “transforming experiments” (Bronfenbrenner, 1977) or “genetic-modeling experiments” (Zuckerman, 2012) as methods of research that go beyond the given and generates new, emancipatory forms of activity. We call these methods formative interventions. They are the core of the emerging methodology of fourth-generation activity-theoretical research (Engeström et al., 2014).

Here methodology is understood as the bridge between theory and data. In other words, the methodology is more than a collection of specific methods or techniques. It puts forward and implements a theory-driven set of principles, or “an argumentative grammar” (Kelly, 2004), upon which the choice of specific methods is based, starting from data collection and reaching all the way to conceptual interpretation of the findings. The argumentative grammar of activity-theoretical methodology is condensed in the principles of double stimulation (Sannino, 2015a, 2015b) and ascending from the abstract to concrete (Engeström et al., 2012).

Aimed at expansive learning, Change Laboratory interventions put into use the principles of double stimulation and of ascending from the abstract to the concrete, typically with a carefully planned sequence of tasks and learning actions. This does not mean that the interventionist's plan is smoothly implemented. To the contrary, participants in formative interventions commonly take over the process at some point and generate deviations from the interventionists' intentions. These deviations reveal gaps between the interventionists' object and the participants' objects – gaps that need to be negotiated. The deviations, gaps and negotiations are important instances of emerging transformative agency among the participants (Engeström & Sannino, 2012).

There is a global push toward formative interventions in multi-activity constellations and coalitions which may include local communities, social movements, educational institutions, private companies, public service agencies, non-governmental associations, and policy-making administrative and political bodies (Gray & Purdy, 2018; Wiewiora et al., 2018). Not accidentally, collective initiatives for such bold formative interventions are increasingly coming from the global south (Lotz-Sisitka et al., 2017; Vilela, 2019). The need for these interventions typically stems for contradictions connected to the quest for social and economic equity and ecological sustainability. Such fourth-generation Change Laboratories face methodological and practical challenges that are different from those of earlier CLs and require concerted research efforts in their own right.

The founders of activity theory, from Vygotsky to Leont'ev, Il'enkov and Davydov, faced revolutionary challenges and also oppressive counter-forces (Sannino, 2011). Today the revolutionary challenge for activity theory is to develop and put to use its conceptual foundations and methodological solutions in the service of formative interventions in multi-activity constellations aimed at creating and enacting alternatives to capitalism. This is also a way to deepen our understanding of human potentials at work in the cultural-historical conditions of the 21<sup>st</sup> century.

## Note

1. We first used the notion of boundary crossing in work on expert cognition (Engeström et al., 1995). Subsequently, Kerosuo (2003) developed the concept in studies of health care. By the notion of boundary, we refer to both formal and practically enacted definitions and limits of membership, competence and authority of organizations, functions or professions. Boundaries typically become visible and articulated when actors try to access something on the other side of the boundary and encounter obstacles or constraints in this quest.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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