

Collective development of a flow of care for children and teenagers exposed to work: using the double stimulation method*


Construção colaborativa de um fluxo de atendimento a crianças e adolescentes expostos ao trabalho: aplicação do método de estimulação dupla (abstract: p. 18)

Construcción colaborativa de un flujo de atención a niños y adolescentes expuestos al trabajo: aplicación del método de estimulación doble (resumen: p. 18)

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continued on page. 16

In Limeira, a city in the state of São Paulo, Brazil, child labour in the production of costume jewellery was recognized as a public health issue. One of the actions taken by civil society and government departments was to create a Committee for eradication of child labour (COMETIL), and to coordinate integrated care services for children and teenagers. This article aims to show how integrated solutions were built, using as a starting point the double stimulation method in a formative intervention (Change Laboratory) at the COMETIL. Data for analysis and identification of agentive actions and expansive learning came from transcripts of a case discussion, of accidental ingestion of acid by a child. Results show that the double stimulation method helped actors to see the flaws in services provided by the town's network and to design a new flow of care.

Keywords: Accident with acid. Double stimulation. Expansive learning. Transformative agency.



Introduction

Mitigation of complex public health problems, such as child labour, demands for integrated services and cooperation of actors from multiple activities. Integral care, promotion and protection of children and teenagers exposed to work come up as non specific motives with ill-defined institutional responsibilities¹⁻³.

Developing integrated care is a challenging process that can be eased through the use of the environment and tools to promote learning and engagement of representatives of different activities involved. Establishing a new service can be understood as an expansive learning process - subjects learn and transform their object/activity's purpose⁴⁻⁶, whereas the process of engagement of actors for changing and transforming the activity can be understood as a formative process of transformative agency⁷. Such a collective process of transforming an activity is also seen as 'collaborative agency' - when people motivated to solve a problem meet in order to create a conjoint object⁸. These meetings happen in 'chains of creative activities', in which people engage to produce meanings shared with different partners in new creative activity^{9,10}.

Transformative agency can be stimulated through formative interventions and with the use of a method of double stimulation^{11,12}. It was originally proposed by the Russian psychologist Lev Vygotsky¹³, and later adapted and used by Engeström *et al.*¹⁴ in an interventionist method - the Change Laboratory (CL). Double stimulation method consists in offering the subjects two stimuli. The first is a task or problem to be solved, whereas the second is a neutral tool (for instance a theory, method, concept) that can be used to solve the problem¹³⁻¹⁶.

In spite of advancements in understanding how the double stimulation method can generate agency and expansive learning, it is not known if and how it can be used in complex problems in the field of public health. Little is known about the kind of mirror data and which neutral concept or artifacts can be used and how these tools are used in producing a new model of service. Mirror data are used to provide researchers and participants the history/mirroring of activity's problem issues so that they can identify problems, analyze together their systemic causes and propose solutions^{14,17}.

In this article we intend to assess if double stimulation strategy using a case of accidental ingestion of acid by a child has permitted to achieve expansive learning and the engagement of actors in improving COMETIL's actions. Two questions guided the evaluation: 1. Does the double stimulation method induce expansive learning and development of transformative agency? 2. If the answer is yes, which kind of mirror data and second stimulus can be used? In order to answer them, we analyzed data from three sessions of the Change Laboratory held at the COMETIL, as well as data of a meeting for discussing the flow of services (in 2017).

We start by describing the context and the case, then proceed to a theoretical reference framework and method of analysis. Results of the analysis are presented using excerpts of empirical material - CL sessions, workshop with healthcare



professionals for discussing the case and the meeting for discussion of the flow (in 2017). Finally, we discuss double stimulation as a tool for promoting changes in COMETIL's operation.

Theoretical framework

In this study, the service of promotion and protection of children and teenagers exposed to work is understood as a network of activities systems (AS). An activity system represents the structure of any given human activity, composed by subjects and members of a community that act to transform an object into results. These subjects use technical mediators, such as physical and psychological instruments (e.g. tools, theories, ideas, models, methods) which mediate their activity; there are also social mediators, such as rules, and work division^{18,19}.

In our study, the object of the activity system is the protection of children and adolescents exposed to work. Activities Systems (AS) are not isolated, they are rather dynamic and interconnected in their internal relationships as well as with other AS, forming a network of AS. Any change in an element that acts as a system mediator leads to contradictions in the activities. Contradictions are understood as antagonistic forces that can generate disturbances and conflicts if not solved^{11,17,20}.

The development of an AS happens by expansive learning, that is brought about through the expansion of the object of the activity in order to overcome contradictions inside the system or among its elements. In general, the object's expansion is accompanied by changes of the other mediating elements of the system^{11,17,20}.

The double stimulation method proposed by Vygotsky and adapted by Engeström²⁰ has been used to promote expansive learning. It is based on the idea that the subject, when confronted with some kind of stimulus situation - for instance a new, more complex task - may need to use a mediator in order to solve it^{12,21}.

In an intervention, the interventionist creates a conflict of motives through the introduction of stimuli. The first one should be able to create an emotional engagement of the subjects, and thus trigger conflicting motives. To solve such conflict, the subject uses a second stimulus - a physical tool or a psychological technique²². These instruments have the potential to promote distancing, allowing the subjects to solve the conflict in a creative way.

The first stimulus is given in the form of mirror data, or of a task that goes beyond the ability of the subjects to solve it. Soon after, the interventionist gives a second stimulus, a neutral artefact for instance, that can be used as a tool to solve the problem^{12,17,23}. The double stimulation method can ease the participants' expansive learning process by introducing tasks that trigger collective understanding about historical contradictions in the AS and, as a consequence, equation/solution of these contradictions by the design of a new object and model of the system.



As Sannino¹² points out, the emergence of agentive-agency action involves motive conflicts as a key component. Expansive learning demands agentive actions for transforming the activity, which is to say transformative agency: it implies a rupture with the existing framework of action and the promotion of new actions aiming to transform it. It is a collaborative elaboration for understanding the conflicts and contradictions in their activities and for a collective change^{12,17,20,23}.

Transformative Agency can be understood as instrumentality for the form of organisation mediated by language, allowing that the participants change their practice since they express and transform an object through discussing ideas that they have about it^{6,7,11,24}.

Child labour at Limeira and Cometil

This study uses a qualitative approach and is part of a set of initiatives of formative intervention conducted by a research group in cooperation with local actors (active members of Cometil), with the objective of debating and building a more advanced network to fight child and adolescent work in the city of Limeira, São Paulo.

Limeira houses the largest pole of manufacture and distribution of jewellery and costume jewellery in the country, a productive chain that has grown in the last decades with international projection. As in any productive pole, its growth was accompanied by different problems: disorderly expansion of informal and/or third party businesses; informal production systems discarding industrial waste in households' sewer system; the increase in the informal and outsourced workforce using child labour (CL) at the households, particularly in assembly tasks (cold or hot welding, crimping and gluing), resulting in worse life and working conditions^{2,3,4}.

A recent study with families which are informal producers of costume jewellery revealed that the chemical composition of the items produced included lead and cadmium in concentrations above the legal limits. It is a situation that exposes the whole family to chemical products, in particular during welding, which contains a mixture of metals and metallic oxides potentially resulting in respiratory problems, ulcers, nervous system damage and cancer²⁵.

Lacorte⁴ has shown that there is a need for implementing public policies for prevention and protection of child and juvenile work, which reaches the houses of poor families in socio-economic vulnerability. He defended a strengthening of Cometil⁴.

Cometil was created in 2003 to try and become a stage for reflection and promotion of actions towards eliminating CL and protecting teenagers. However, in order to work properly it needs the engagement of its members, professionals coming from different town institutions⁴. To develop its services and strengthen its actions in the region, Cometil invited the University of São Paulo's Public Health Faculty to conduct an intervention using the Change Laboratory (CL).



Methodology: data and method of analysis

CL at COMETIL had seven sessions, held from 2016 to 2017, plus one workshop with the town health services. Of the eight sessions, two consisted of follow up in 2017. Each session lasted two hours and involved 20 participants coming from the local administration institutions. We also took part in a meeting to discuss the flow within the network, which gathered 14 participants representing COMETIL's composing institutions.

Since this paper's objective is to understand the dynamics and structure of the double stimulation process during the design of an integrated flow of services to eradicate child labour, we chose three sessions in which participants analyzed the case of accidental acid ingestion by a 5-year-old child. The case was used as a strategic mirror data to foment the debate about reality; it was a turning point, after which the actors/participants began to design the new model of integrated services.

The case was used in two of the CL sessions. An extra session with health services' staff was suggested and held to compensate for their lack of active participation during the CL. The municipal health department's services and professionals attending this workshop were: representatives of the Occupational Health Service (OHS), Family Health Centre (FHC), community health workers and the managers of a private hospital.

Data collection

Data used for this study come from the transcripts of three sessions of the COMETIL CL and a meeting for discussing the flow within the network. Each recorded session lasted two hours. A summary report of the case was used as first stimulus and a schematic overview (Figure 1) as second stimulus.

**Frame 1.** Summary of collected data

Procedure	Objectives	What?	With whom/ with what?	How long
Participation and recording of - Two sessions of COMETIL CLand - Workshop with health professionals - Meeting to discuss the flow	-To analyze if expansive learning occurs	Transcription of the sessions and workshop Meeting to discuss the flow	20 Participants in the sessions 12 participants of the workshop 14 at the meeting	Sessions lasted 2 hours 32 hours per session approximately for transcription
Analysis of transcripts	-To identify occurrence of critical speeches that provide evidences/linguistic clues to the study	Speech episodes	Transcription material	40 hours approximately
Total				74 hours approximately

Source: elaborated by the authors.

Method of analysis

Transformative agency can manifest and be verified through discursive expressions and is subdivided in 6 types: (1) resistance to change and to the intervention. It appears as questioning and opposition to change or to accepting the problem, and is considered a primitive but instigating form of learning in conflict situations and not necessarily an opposition; (2) criticism to existing activities and organization; (3) explanation of activity's new possibilities or potential, positive experiences, new challenges that highlight the possibilities for change; (4) prediction or understanding of new patterns or models for the activity; (5) engagement towards implementing concrete actions for changes in/for the activity; and (6) taking action: (to inform or to have taken) consequential actions to change the activity (Vänninen et al., 2015; Lopes, 2018; Haapasaari et al., 2016)^{7,11,24}.

Based on the information that we received about the accident, and in order to trigger discussion, we prepared a schematic overview of the case (Figure 1), highlighting the health services that first received the child. As a second stimulus we asked the participants to identify, in the scheme, the gaps in care rendering (Figure 1).

In the transcriptions we searched for discursive displays as evidence of the evolutive process of agentive actions. We used linguistic clues to identify the six types of transformative actions proposed by Vänninen *et al.*^{7,8,11,23}. Some discursive excerpts were extracted in order to give examples of expansive learning progress through evidence of agentive actions and to demonstrate the importance of the double stimulation method.

Participants were identified by numbers (P1, P2, etc.) and by the session in which they spoke out on. Two people from the health services took part in the CL sessions but did not speak there, instead spoke during the workshop. In the meeting that was held for discussing the flow within the network there was only one person from the health services.



This study was made in accordance with ethics in research guidelines established by the Resolution n. 196/96 of the National Health Council and was approved by the Ethics in Research Committee under inscription number CAAE 11886113.5.0000.5421. It is a part of the thematic project Work Accident: from sociotechnic analysis to social construction of changes, FAPESP, Process 2012/04721-1. Effective in: 2015/2016, 2016/2017 e 2017/2018.

Results and discussion

The sessions that used the case were started by asking participants to read a two pages case report (first stimulus) for discussion.

Frame 2. Summary of the accident case

The mother of the child that ingested acid works welding costume jewellery. She receives the pieces at home and uses the acid to clean the surface before applying the welding substance. As it is a small quantity, it is stored in a common, 500 ml plastic water bottle. The report states that on the day of the accident (October 2016), the household did not have electric energy due to lack of payment. The child asked for water and the mother went to the kitchen to fetch it, but the child saw the bottle, similar to any water bottle, and drank the liquid. It was not defined the total amount she drank. The family took the child to the Family Health Centre (FHC) nearby, where the staff, understanding how serious the accident was, called for Emergency Removal to take the child to the closest public hospital. There the child was given emergency treatment and subsequently was transferred to another hospital, of greater complexity and more resources, in Campinas. Due to lack of equipment for better treatment, the whole process of care took a few days. From the moment when the child stepped in the FHC to the other instances of health care there was a long path (among phone calls, reports, documents and notifications) to be followed. However, during this time consuming path, the institutions involved in COMETIL were not informed. The case was treated as a serious domestic accident.

Source: Elaborated by the authors based on the report received.

The acid accident case involving the child was not reported as a work accident, according to the information obtained later by participants that worked in the social services institutions. However, because it involved work done in a residential home, using welding and chemical products, it was eye-catching the lack of immediate communication to the Guardianship Council and to the institutions that integrate Cometil, since the emergency care was given at the Family Health Centre (FHC). This situation triggered a discussion about the gaps in the services network, because of the lapse of a fortnight before the Social Services (Social Assistance Centre - CRAS; Specialized Social Assistance Centre - CREAS; Cometil) were informed, which happened only during a course directed to community health agents. Besides, the case never reached the Workers' Health Program or the Epidemiology Surveillance Program.



In this sense, the discussion about reformulating and implementing the service flow, which was happening in parallel to the CL, gained momentum, and the case could be used to provide inputs to the discussions and to Cometil's activities.

In the next session, in order to identify the existing gaps in the services network, the schematic overview of the case (figure 1) was offered as a second stimulus. It allowed participants to pinpoint the sequence of events and treatments received by the child. The objective of this activity was to generate contributions to develop the service flow within the Cometil network.

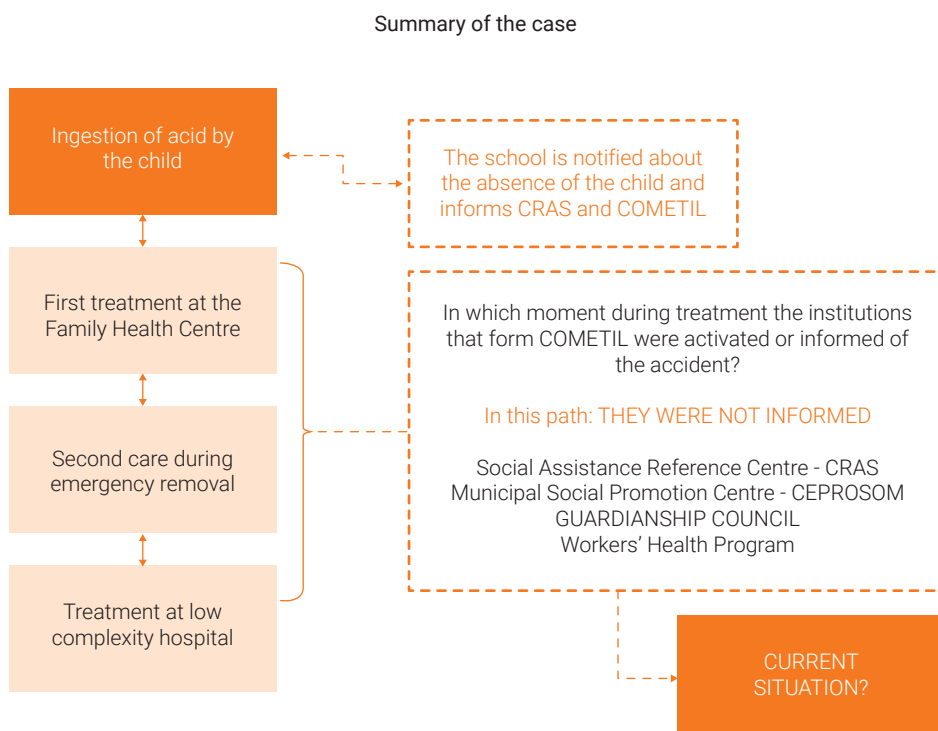


Figure 1. Summary of the case

Source: Elaborated by the authors.

Figure 1 presents the summary of the case; smoky orange indicate the path of the family whilst taking the child to emergency care and the institutions in it; it was not possible to establish the time of each procedure. Dotted orange lines indicate the gaps identified during CL sessions, used to guide discussions and answer to participants' questions.

In the following excerpt, a participant criticizes previous actions, which characterizes an agentic action of explanation by revealing failure recognition and discontinuity of actions.



[...] From the moment when the child arrived to hospital all the services had to be summoned, Workers Health Program, COMETIL, Guardianship Council, to assess if it was child labour [...] [...] (P 1 – session 3 CL)

Below, a discussion about the case and the agreement of the utterances demonstrate: agentive actions of criticism and understanding - by seeing the need for sequencing the follow up actions; explanation actions demonstrated by the possibility and visualization of a tool such as the flow in the network.

[...] when one makes a referral and feels that it is finished, it's a big knot! The referral does not solve the problem... there has to be a follow up. (P 2 – session 3 CL)

[...] regarding the flow [...] Where did the case arrive first? In a health service! Unfortunately [...] the engagement of the health staff is very low. If the child had been attended to in the flow of network services, maybe things would be quicker [...] (P 3 – session 3 CL)

[...] what strikes us is that the child went through all the services (Family Health Centre, Emergency Removal Service, Low complexity hospital, and nobody asked if it could be child labour. [...] nobody had an attentive look at that child (P 4 – session 3 CL)

[...] I think that there is an aggravating factor. The family did not have information about the product, and did not know how to proceed. Three highlights: the family, because of the child, was already in danger for manipulating such substances (without identification of the product); second, because the hospital made the contra-referral to the Family Health Centre, they should have... they have direct contact with the family; third, did its staff - that works in the territory and where the meetings happened, did they relayed to the network? Did they articulate within the territory? Because the network was activated by people from education and social services [...] this is a gap [...] (P 5 – session 3 CL)

[...] There is a detail that I feel sorry about in this process [...] we have to start working towards damage remediation and orientations for occupational safety [...] we are in a region with a huge contingent of women who work in that [...] [...] The other proposal for 2017 is to deal with child labour not promoting an event, but doing smaller actions in which we can welcome people and have this approach of disseminating the idea [...] (P 8 – session 4 CL)



These critics - manifested regarding the operation of the health network whilst the participants were discussing and elaborating a general flow for the Cometil, as well as their commitment with proposals of future action - demonstrate their understanding of the need for integration between the flows of the different public institutions. To approach this case as an accident, related or not to precarious work, indicates a more systemic vision for action.

The expressions of criticism are followed by agentic actions of understanding and explanation with formulation of proposals, showing reinterpretation of routine situations in a cognitive reconstruction of the proposal of Cometil's proposal using the models presented as a starting point (Figures 1 and 2).

The models have an important function in these collective constructions, because they work as a facilitating image that, displaced from its previous context, allows the passage - an expansive transition activity - to a new context. Engeström calls this elaboration of models a trampoline. They usually come up in distress situations as some sort of life jacket^{7,11,22,23}.

This sequence of agentic manifestations - of resistance or critics, explanations, of visualizing new steps, engagement with what they visualized (new flow, smaller actions) and consequential actions taken - are described in other studies as being evidence of a process of on-going transformative agency and of expansive learning leading to evolution of the group^{7,11,23}.

Some manifestations showed engagement for action, either through smaller actions or by searching models - decision-making actions - that could help implementing tools within the flow. Again, discursive data were complemented with the flow models^{7,11,23}.

During the session with health professionals manifestations of resistance and crisis were seen - some participants searched for guilty ones, revealing a short-sighted, not systemic view of the problem. Other manifestations, however, tried to develop more integrated discursive actions, as it will be seen below.

[...] On the question of responsibilities that she raises, the Police is not mentioned here... If the mother goes to the supermarket and forgets the child in the car it is a crime. Now, this child ingests acid inside the home, isn't this a crime? Has the Police been involved, to establish the responsibilities of the parents? (P 2 – health workshop)

[...] The staff turnover is huge in the hospitals and health centres. Then, does everybody know the procedures and the flow? They don't!... For instance, in 2015, when the network for integrated care to women exposed to violence, everybody was trained. Everyone knows it by heart. Now, in this question they haven't! We do not have this flow of procedures well established. So, the child arrives at the health centre, but the unit did not have the basic competencies to treat, they called Emergency Removal Service, but they did not activate the Guardianship Council. Nobody filled the "notification form". They did not see it as child labour [in fact it wasn't, it was rather related to precarious/outsourced work]; when the company



sends the product in PET packaging with no labels identifying the product, it is really hard to find out toxicology information and how to treat [...] the way it was packed, there is not enough information to act [...] that's why it is important to have a structured network. [...] (P 3 – health workshop)

[...] Managers weren't engaged enough to solve [the problem], and not only blame so and so. The hospital should have [accredited] doctors that own the equipment and call them in in case of need! Really, they should have gotten in touch with the public agencies related to this case. The biggest problem is the informality of the issues, because it creates this difficulty of controlling what happens, for instance the handling of this chemical product. These things escape the reach of inspections. [...] (P 4 – health workshop)

It can be shown that there is a learning process in different moments, through the different configurations of transformative agency, particularly when problem situations happen and put participants in opposition, bringing about the need to act together in search of solutions for specific cases. This type of tension and divergence lead to new proposals and future configurations^{6,7,11,23}.

In the meeting to discuss the format to be adopted and to define the network flow of COMETIL in 2017, there was a general agreement in that there was a lack of a single instrument that could, with due care for people's privacy, be circulated among the different institutions. That meeting gathered participants representing the different public institutions.

Below we transcribe part of the discussion that is directed towards agentic actions and decision making in order to implement a network flow (figure 2) as an action tool. Even though this last design had problems, it still allowed the strengthening of the enhancement movements, an indication that the group was developing its own tools for development.

[...] there are many ways through which a complaint reaches the Guardianship Council. Afterwards, the confirmation with CREAS - Social Services Specialized Centre -, the suspicion with CRAS - Social Assistance Centre, and afterwards the deployments in each of these departments [...] (P 7 – observation meeting)

[...] that for treatment. One has to look at all the others, it goes in as a suspicion in health services? [...] (P 6 – observation meeting)

[...] which department is to receive it first? Cometil, all of them? That has to be defined. (P 1 – observation meeting)



[...] the work of one does not prevent the work of the others. What we want is to work together with the same information. (P 2 – observation meeting)

[...] we are in the process of systematizing this flow and giving all the services access to organize information. We have invited (mention the names of different institutions). We are asking the town hall to implement this system. (P 7 – observation meeting)

[...] in building this flow the interesting thing is that, because of the case of the little girl that ingested acid we realized an initial flaw - the social assistance services were informed but did not relay the information [...] (P 7 – observation meeting)

[...] I agree that health services should be more prepared for that. But let's suppose that it was bleach that was ingested, let's suppose it was being used in child labour. There, we have to improve that! It is striking that it was acid, but the child was not working. We have to think about this information both macro and micro, the case is open, we have to solve it, and I go back to my suggestion: these forms we're using could be the procedures sheet, to be filled by all the services up to the end. (P 7 – observation meeting)

In these fragments, the example of the case is mentioned to explain the need both of better defining the paths to be followed for the network flow and the details of referral. There is agentive action of critics and explanation that evolves towards proposals for improving the flow. Also, there is the confirmation that the use of the case as part of the Double stimulation was important for the discussions and for engaging participants.

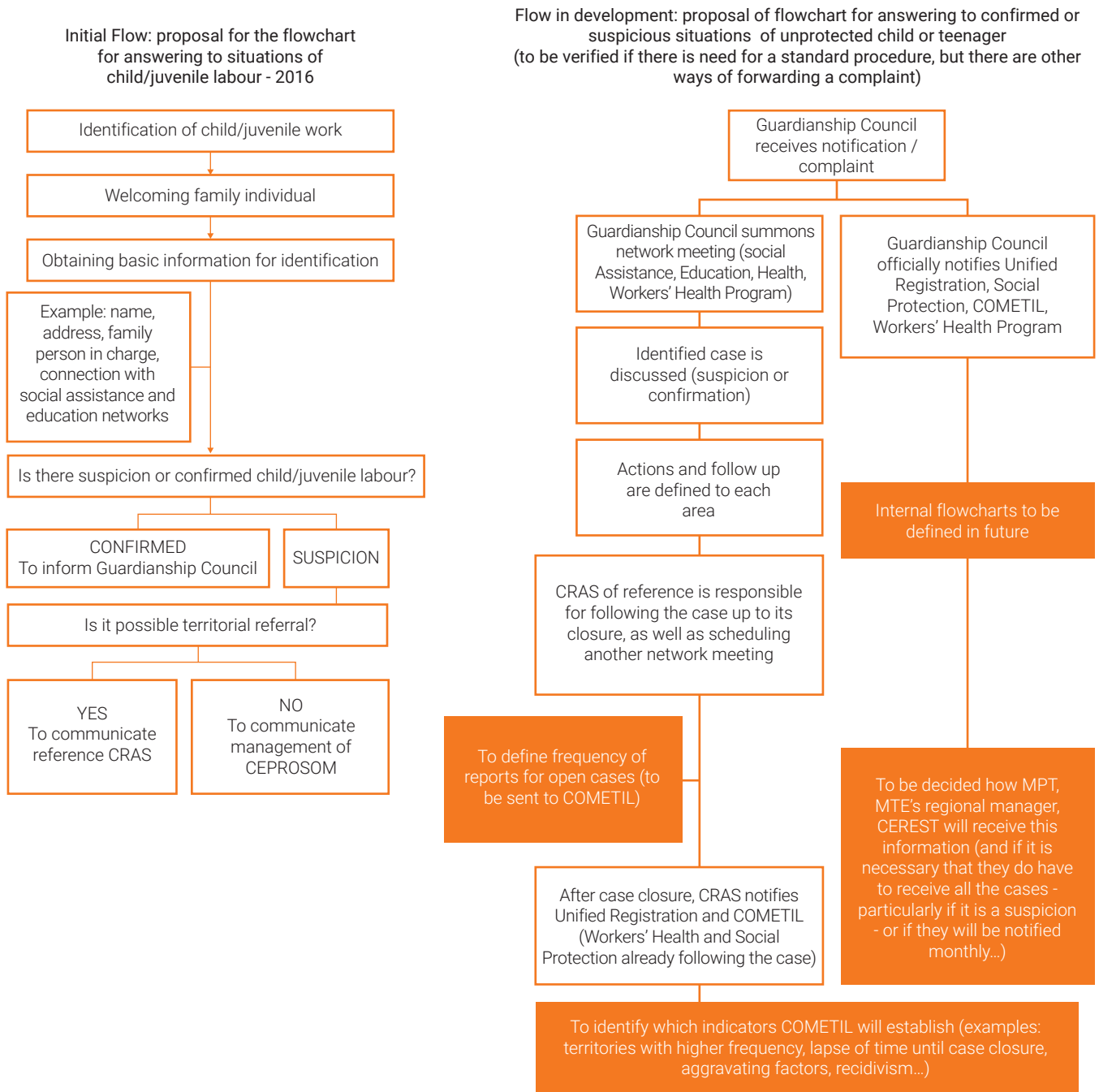


Figure 2. Evolution in the designs of the flow. They were elaborated by participants/members of Cometil.
Source: Flowcharts provided by Cometil.

These innovations and developments happened out of the CL (Figure 2). They consist in manifestations of transformative agency that go beyond CL, as it is recommended by the method^{6,7,11,22,23}.

A disclosure related to innovation was the perception that smaller actions, closer to the territories where the reference centres of Social Assistance and Health and of the schools should be tried, since they could stimulate exchanges, including with the families. This perception is a strong indication of the development of a systematic and integrative vision^{6,7,11,22,23}.

The network flow was the result and the organization solution for Cometil, that has to integrate different actions of institutions with different forms of organization. It consists in a significant change in the work division of the participants in their institutions of origin^{6,7,11,22,23}.

According to Engeström^{20,26}, this type of construction is a work of co-configuration. It happens, in general, in fields where different organizational forms operate, therefore where there are many AS, neighbour activity systems that share the same object (Figure 3), but usually have their own object: it would be like shared clients with little evidence of collaboration between the organization limits^{20,26}.

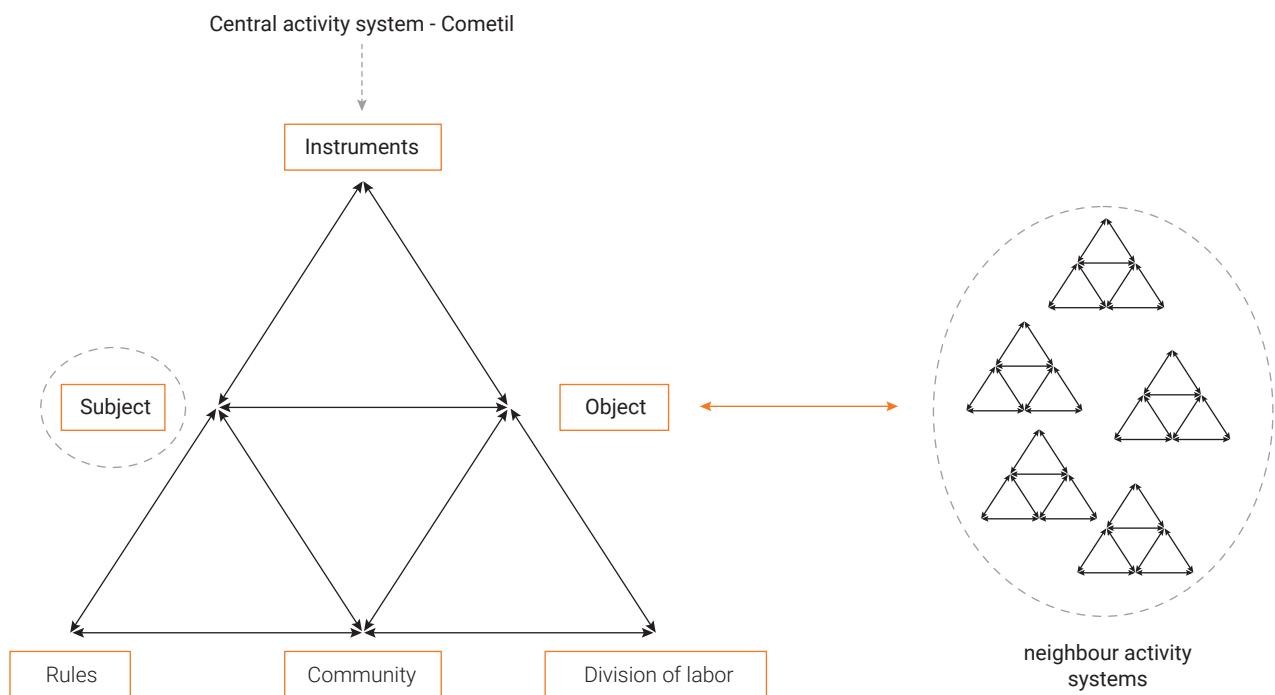


Figure 3. Central activity system - Cometil and neighbour systems

Legend: Activity system and constitutive elements of Cometil

The orange arrow links Cometil's object to the Activity Systems of its institutions, or neighbouring systems.

Source: adapted from Engeström²⁰ (p. 116)

Note: the institutions where the members of Cometil come from: Ceprosom; Cras and Creas; Workers' Health Program; Epidemiology Surveillance Program; Family Health Centre.

In this process of co-configuration, the expansion of the object happens in four dimensions. One is the socio-spatial, which means that many AS are involved in the transformation of the object. A second dimension is the temporal expansion, that demands the Constant reconfiguration of the object along time, domain of history. The third expansion is moral-ideological; it implies in responsibilities and in Power being redistributed and negotiated constantly among the participants. The last expansion is systemic, of the development; in it routine actions are increasingly problematized and related to their systemic consequences and potential for development. Engeström and Sannino²⁶ explain also that organizational processes and



arrangements are increasingly more complex, demanding of participants constant partnerships, that they play roles of negotiation, of mastering activities, because they act at the frontiers of the AS.

In table 3 we present the steps that show the trajectory that led to expansive learning and transformative agency.

Frame 3. Trajectory leading to transformative agency and expansive learning

Steps	Activities carried out
1	Presentation of the case of a child that ingested welding acid
2	Discussion of the case; appearance of characteristic types of transformative agency: actions of criticism and resistance; understanding and explanation; engagement; decision making
3	Redesign of network flow (fig.3); new proposals of action

Source: elaborated by the authors.

Final considerations and future perspectives

The objective of this study was to show how the method of double stimulation is an important mediatory artefact and contributes both to visualizing alternatives and overcoming gaps within the AS.

The real case used as mirror data helped participants to realize the need for integration among different actors and institutions, to identify problems and build solutions independently after the formative intervention.

The examples of discursive manifestations presented here reveal the appearance of agency in the participants' interaction. They also reveal that there are contradictions among the different activity systems in which the participants work, and that the discussion about the object strengthened the initial belief of the group about the need of establishing the flow of procedures in the network (figure 2).

Future challenges include a deeper diagnostics of the activities within each of the institutions that form COMETIL; maybe this will allow a more detailed understanding and the definition of their own network flow.



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All the authors took part in all the steps of elaboration of this manuscript.

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References

1. Donatelli S, Vilela RAG, Querol MAP, Gemma SFB. Envisioning a solution for a runaway object: a formative intervention in a network to combat child labor. In: Vilela RAG, Querol MAP, Lopes MGR, Cerveney GCO, Beltran SL. Collaborative development for the prevention of occupational accidents and diseases - change laboratory in workers' health. São Paulo: Springer; 2019. p. 113-30.
2. Ferreira MAL. Estudo de riscos à saúde do trabalhador e ao meio ambiente na produção de joias e bijuterias de Limeira-SP [dissertação]. Piracicaba: Faculdade de Engenharia, Arquitetura e Urbanismo, UNIMEP; 2005.
3. Vilela RAG, Ferreira MAL. Nem tudo brilha na produção de joias de Limeira – SP. *Produção*. 2008; 18(1):183-94.
4. Lacorte LEC, Vilela RAG, Silva RC, Chiesa AM, Tulio ES, Franco RR, et al. Os nós da rede para erradicação do trabalho infanto-juvenil na produção de joias e bijuterias em Limeira - SP. *Rev Bras Saude Ocup*. 2013; 38(128):199-215.
5. Querol MAP, Cassandre MP, Bulgacov YL. Teoria da atividade: contribuições conceituais e metodológicas para o estudo da aprendizagem organizacional. *Gest Prod*. 2014; 21(2):405-16.
6. Querol MAP, Seppänen LMA, Jackson JMF. Understanding the motivational perspectives of sustainability: a case of biogas production. *Production*. 2015; 25(2):266-77.
7. Vänninen I, Pereira-Querol M, Engeström Y. Generating transformative agency among horticultural producers: an activity-theoretical approach to transforming Integrated Pest Management. *Agric Syst*. 2015; 139:38-49.
8. Miettinen R. Creative encounters and collaborative agency in science, technology and innovation. In: Thomas K, Chan J. *Handbook of research on creativity*. Cheltenham: Edward Elgar Publishing; 2013. p. 435-49.
9. Liberali FC. A cadeia criativa no processo de tornar-se totalidade. *Bakhtiniana Rev Estud Discurso*. 2009; 1(2):100-24.



10. Lemos M, Liberali F. The creative chain of activities towards educational management transformation. *Int J Educ Manage.* 2019; 33(7):1718-32.
11. Lopes MGR, Vilela RAG, Querol MAP. Protagonismo para uma compreensão sistêmica sobre acidentes de trabalho e anomalias organizacionais. *Trab Educ Saude.* 2018; 16(2):773-98.
12. Sannino A. The principle of double stimulation: a path to volitional action. *Learn Cult Soc Interact.* 2015; 6:1-15.
13. Vygotsky LS. *Formação social da mente.* 3a ed. São Paulo: Martins Fontes; 1989.
14. Engeström Y, Pihlaja J, Helle M, Virkkunen J, Poikela R. The change laboratory as a tool for transforming work center for activity theory and developmental work research, university of Helsinki. *Lifelong Learn Eur.* 1996; 1(2):10-7.
15. Pereira-Querol MA. Método de estimulação dupla. In: Mendes R, organizador. *Dicionário de saúde e segurança do trabalhador: conceitos, de nições, história, cultura.* Nova Hamburgo: Proteção Publicações Ltda; 2018. p. 752-3.
16. Querol MAP, Seppänen L. The theoretical and methodological basis of the change laboratory. In: Querol MAP, Seppänen L. *Collaborative development for the prevention of occupational accidents and diseases.* Switzerland: Springer; 2020. p. 13-28.
17. Virkkunen J, Newnham DS. *O laboratório de mudança: uma ferramenta de desenvolvimento colaborativo para o trabalho e a educação.* Belo Horizonte: Fabrefactum; 2015.
18. Pereira-Querol MA, Jackson Filho JM, Cassandre MP. Change laboratory: uma proposta metodológica para pesquisa e desenvolvimento da aprendizagem organizacional. *RAEP Adm Ensino Pesqui.* 2011; 12(4):609-40.
19. Pereira-Querol MA. Teoria da atividade e o sistema de atividade. In: Mendes R, organizador. *Dicionário de saúde e segurança do trabalhador: conceitos, de lições, história, cultura.* Nova Hamburgo: Proteção Publicações Ltda; 2018. p. 1133-5.
20. Engeström Y. *Aprendizagem expansiva.* Liberali F, tradutor. Campinas: Pontes Editores; 2016.
21. Engeström Y. Putting Vygotsky to work: the change laboratory as an application of double stimulation. In: Daniels H, Cole M, Wertsch JV. *The Cambridge companion to Vygotsky.* Cambridge: Cambridge University Press; 2007. p. 363-82.
22. Engeström Y. *Learning by expanding an activity-theoretical approach to developmental research.* Helsinki: Orienta-Konsultit; 1987.
23. Haapasaari A, Kerosuo H. Transformative agency: the challenges of sustainability in a long chain of double stimulation. *Learn Cult Soc Interact.* 2015; 4:37-47.
24. Haapasaari A, Engeström Y, Kerosuo H. The emergence of learners' transformative agency in a change laboratory intervention. *J Educ Work.* 2016; 29(2):232-62.
25. Salles FJ, Sato APS, Luz MS, Fávaro DIT, Ferreira FJ, Paganini WS, et al. The environmental impact of informal and home productive arrangement in the jewelry and fashion jewelry chain on sanitary sewer system. *Environ Sci Pollut Res Int.* 2018; 25(11):10701-13.
26. Engeström Y, Sannino A. Expansive learning on the move: insights from ongoing research. *Infanc Aprendiz.* 2016; 39(3):401-35.



Em Limeira, cidade do estado de São Paulo, Brazil, houve o reconhecimento da existência de trabalho infantil ligado ao setor de produção de bijuterias como problema de saúde pública. Uma das iniciativas da sociedade civil e entes governamentais foi a criação da Comissão de Erradicação do Trabalho Infantil (Cometil), para coordenar o processo de atendimento integrado a crianças e adolescentes. O objetivo deste artigo é mostrar como ocorreu a construção de soluções integradas por meio da utilização do método de estimulação dupla usado na intervenção formativa (laboratório de mudança) aplicada na Cometil. Os dados para análise e identificação de ações agentivas e aprendizagem expansiva provêm da transcrição da discussão do caso de ingestão acidental de ácido por uma criança. Os resultados mostram que o método de estimulação dupla permitiu aos atores visualizar lacunas nos serviços prestados pela rede e desenhar novo fluxo de atendimento.

Palavras-chave: Acidente com ácido. Estimulação dupla. Aprendizado expansivo. Agência transformadora.

En la ciudad de Limeira (cidade do estado de São Palo, Brasil) hubo el reconocimiento de la existencia de trabajo infantil vinculado al sector de producción de bisuterías como problema de salud pública. Una de las iniciativas elaboradas por la sociedad civil y entes gubernamentales fue la creación de la Comisión de Erradicación de Trabajo Infantil (COMETIL) para coordinar el proceso de atención integrando a niños y adolescentes. El objetivo de este artículo es mostrar cómo ocurrió la construcción de soluciones integradas a partir de la utilización del método de estimulación doble utilizado en la intervención formativa (laboratorio de cambio) aplicado con el COMETIL. Los datos para análisis e identificación de acciones de agencia y aprendizaje expansivo provienen de la transcripción de la discusión del caso de ingestión accidental de ácido por parte de un niño. Los resultados muestran que el método de estimulación doble permitió que los actores viesen las lagunas en los servicios prestados por la red y diseñasen un nuevo flujo de atención.

Palabras clave: Accidente con ácido. Estimulación doble. Aprendizaje expansivo. Agencia transformadora.

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