

Applying Technologies of the Self in Transformation Labs to Mobilize Collective Agency

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Abstract

Transformation Laboratories (T-Labs) are human-centered participatory spaces aimed at fostering both the personal development of participants, and the generation of new collective agency in heterogenous groups of actors motivated by the goal of transforming the social-ecological systems they inhabit. T-Labs can benefit from employing “technologies of the self” (ToS), which are participatory tools to assist self-reflection by drawing people’s attention to their own social-ecological agency. Academic researchers can act as convenor/facilitators of T-Labs by playing the dual role of providing both tested ToS for building collective agency, and access to specialized expertise and knowledges, according to the needs of each group. The process may involve existing or new economic activities but is transformation-driven rather than profit-driven. This paper reports on a 3-years project that implemented a T-Lab in Xochimilco wetland in Mexico City. The project created and applied 10 ToS. Two of them, Ego-nets and Avatars are presented to illustrate their transformative potential.

Keywords: Transformation Laboratories, technologies of the self, T-Labs, collective agency, transformative agency



Photo by I. Estrada / Xochimilco T-Lab, Mexico City

Leveraging transformative agency through Technologies of the Self

Building new collective agency -- the capacity and motivation of a group to act on its own behalf-- is key to fostering transformations. Collective agency may naturally emerge in homogeneous contexts where people share common perspectives, cultures, interests or intentions. However, for transformative change, collective agency often requires involving heterogeneous groups of agents whose interests and perspectives are not necessarily aligned and would normally not work together (Marín *et al.*, 2016). The challenge in such cases is to access deeper, less obvious layers of commonality, beyond apparent differences. We describe a specific participatory process, framed under the approach of T-Labs, through which specific methods and tools provide access to deeper layers of commonality and empathy or *feeling* for the other and allow inside-out transformations (O'Brien 2013; Horlings 2015; Ives *et al.* 2020). Inside-out transformations emerge from the personal processes through which subjects/participants understand and constitute themselves in relation to a system (Manuel-Navarrete and Pelling 2015). Inside-out transformations are deliberate, intentional, and subjectively activated through the questioning of individual and shared beliefs, values, worldviews and paradigms (O'Brien 2012; Manuel-Navarrete *et al.* 2019). Every participant in a T-Lab reflexively explores their own agency and shares the outcome of their self-exploration with others (Charli-Joseph *et al.* 2018). In this sense, every participant is a seed under human development and the T-Lab's function is to contain them and allow all seeds to flourish within the group.

In our implementation of T-labs in Mexico City, we created and employed specific Technologies of the Self (ToS); a set of methods and tools to foster the type of deep self-exploration that transformative collective agency demands. ToS support agents in shaping their relationship to the system, to others in the system, and to themselves. How different ToS provide this support will vary with context, and part of the role of T-Labs is to facilitate self-inquiry about what specific forms of support are needed by each individual and the group as a whole. As defined by Foucault (1988:18), ToS “permit individuals to effect by their own means or with the help of others a certain number of operations on their own bodies and souls, thoughts, conduct, and way of being, so as to transform themselves in order to attain a certain state of happiness, purity,

wisdom, perfection, or immortality”. In our T-Labs, ToS also had a collective purpose -- to find common ground and build collective agency while also enabling deep self-reflection, both of which are critical ingredients for the sustainable transformation of a system.

By articulating ToS within participatory processes such as T-Labs, we approached collective agency and transformations from the inside-out. This is in contrast with other participatory approaches that objectify, analyze, assess, or imagine systems “out there”, and their future, and assume that such abstracted systems are *transformable* through external manipulation, visioning, or other intellectual skills. Inside-out transformation focuses instead on encouraging people to transform themselves with the idea that collective self-transformations will trickle down into the systems they inhabit and co-create. This involves breaking the perception that the systems we need to transform are out there and can be manipulated from outside. Oneself is the system, and the system is in oneself.

In practical terms, ToS allow individuals to gain skills for self-understanding (e.g., raising awareness of one’s own ability to harness the process of understanding oneself), which is a key process to foster transformative agency. The ways in which we perceive the world, and our place in it both as individuals, and as being “one with it”, depend on how we understand ourselves (Archer 2007). In this view, our perceptions and experiences are always mediated by our own self-understanding, which is also the process through which we make or constitute ourselves as human beings. In essence, ToS can be seen as operating on individuals as “self-reflexive levers” that can activate deeper intentions towards transformation (Meadows 1999). T-Labs seek to scale individuals’ intentions up to the collective level by entangling self-reflexive processes within loosely coordinated and dynamic participatory processes designed with the ultimate goal of transforming a social-ecological system (Manuel-Navarrete et al. 2019).

T-Labs and Technologies of the Self

The notion of T-Labs was developed in the context of the ISSC 'Transformative Pathways to Sustainability' network as part of the work of the STEPS Centre's global consortium (Pathways 2018, Pereira et al. 2020). The STEPS Center’s North American Hub designed and tested a combination of 10 ToS in the context of Xochimilco’s T-Lab in Mexico City for building collective agency with 19 participants between 2016 and 2019 (see Ruizpalacios et al. (2019) for details). These 10 ToS can be used in or adapted to other contexts, and convenor/facilitators of T-Labs should be encouraged to experiment with new ToS according to participants’ needs. An important role for facilitators is providing participants with access to specialized expertise as knowledge needs arise throughout the collective self-reflexive process. An important procedural rule for facilitators is to stay focused on the process, thus refraining from trying to direct the group towards predetermined outcomes. T-Labs could eventually yield transformations of external objects, including things, situations, narratives, discourses, systems, behaviors, or conducts; but in our case we conceived such external outcomes as byproducts of the T-Lab’s main focus; that of enabling people to transform themselves.

Ego-nets and Avatars

Ego-nets, and Avatars are two examples of ToS tested in Xochimilco’s T-Lab. Ego-nets allow participants to identify and reflect on their existing collaborations and spaces for social action (Figure 1). Unlike other social network analysis tools, by presenting the self in relation to actions and activities done with others, Ego-nets seek to make visible to each participant how their agency is situated within networks of social relationships and activities. They are not about comprehensively or objectively mapping all relations, but, as ToS, seek to bring attention to the most significant relationships as perceived by the agent in a particular moment. In fact, the focus is not so much on the relationship per se, but on the actions enabled by these self-reported relations. The reality of the existence of the relationship is a self-reported fact; its importance is perceived by the agent and as such it has an effect on agency. Ego-nets are meant to be dynamic and change constantly as agents’ subjective perceptions of their relations evolve.



Photo by B. Ruizpalacios / Participant creating her Ego-net

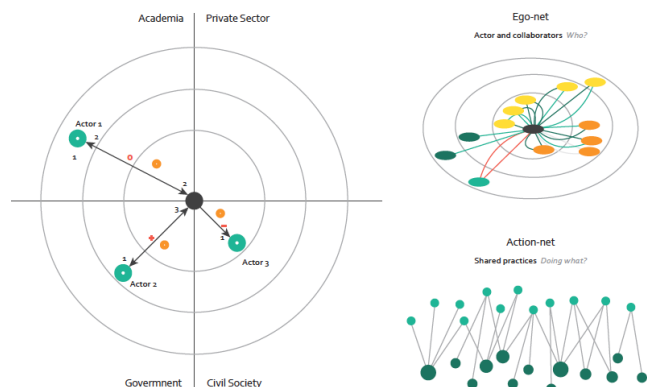


Figure 1: Illustrative sketch of Ego-nets and Action-nets diagrams
 Figure designed by Brenda Hernández

When shared with the group, individual Ego-nets can become a powerful tool to visualize possible alliances with other participants, through which everyone’s networks of collaboration can be extended. Ego-nets can be complemented with action-nets composed of the practices that characterize the agents’ collaboration as they perceive them. The Ego-nets and Action-nets together depict what we call the social action arena, which depicts the interviewee’s social capital and role in system dynamics.

Avatars are visual representations of the powers that each of us feels we bring to any social action arena (Figure 2). Such powers are any characteristics or capabilities that an individual can contribute in a social relationship, and that can be "activated" to achieve specific goals. Avatars are meant to be powerful abstractions of oneself according to one’s own self-image. While Ego-nets can unveil “with whom” one collaborates, Avatars are about raising awareness of “who” (i.e., what version of oneself) is put forth in the collaboration towards systems transformations. This “who” does not mean a social role, but rather how the agents perceive themselves more broadly as human beings, and what they think they are bringing, or would like to bring, to the collaboration. Thus, creating Avatars involves self-reflecting about the agents’ “power within”, rather than their “power with”. That is, about the role that self-worth and self-confidence play in collective agency, rather than that played by solidarity and the sense of belonging to a group (Chambers 2013). As in the case of Ego-nets, Avatars’ powers are not meant to be objectively defined and are necessarily dynamic and contextual. It is not so much about what powers one actually has, but what powers one believes to have at a certain moment in time and in a specific context.

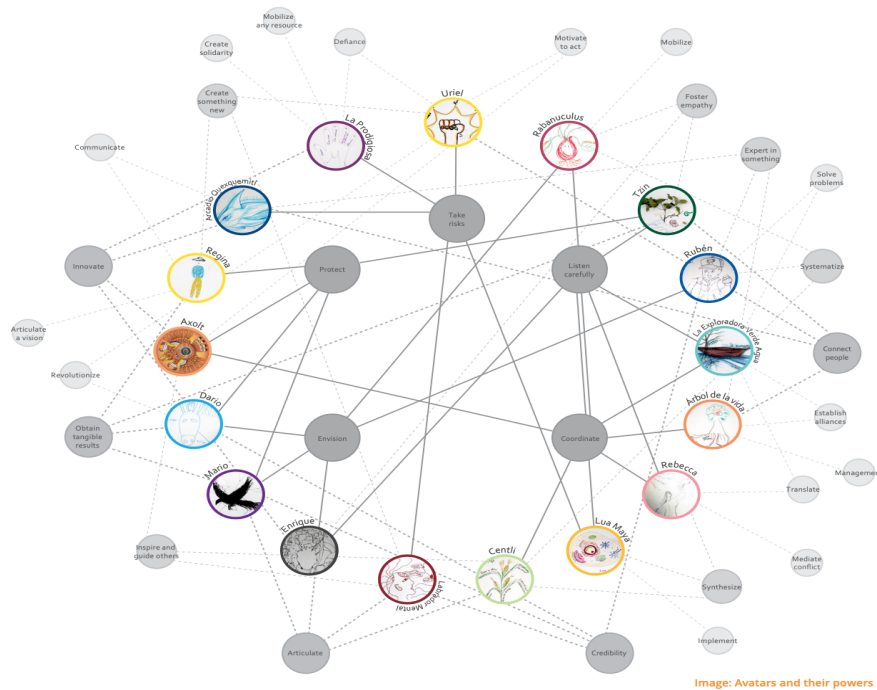


Figure 2: Network of Avatars created by participants in the Xochimilco T-Lab
 Figure designed by Brenda Hernández

After being shared with the group, Avatars can be invoked by others at anytime during T-Lab activities. Once they are created, anyone can bring up their own Avatar, or call others' Avatars up to add specific powers to the task at hand. In Xochimilco's T-lab, Avatars were used as a "stand-in" for absent participants. Powers from different Avatars can be complementary and be combined for specific purposes. For example, as a group contemplates specific course of action or possibilities of system change, they can relate such activities to the capacities that exist, alone and in combination, within the group as a collective. Through such combinations, Avatars empower not only individuals, but also the group. In fact, Avatars can facilitate the actual matching and collaboration of two or more participants by enabling them to see the complementarity of their "powers" and how combining them can advance the goals or needs of the group. In this way, Avatars can help to set aside the complexity of multi-dimensional differences in personality in order to strategically advance collaboration.

Lessons learned

The application of ToS produces rich data about the participants' agency, including their awareness and perceptions of themselves. This data can feed analytical and visualization tools. In the case of Xochimilco's lab, the facilitators combined stakeholder network mapping and cognitive maps to create a methodology, Agency Network Analysis (ANA), to represent individual agency (Charli-Joseph et al. 2018). ANA provided a series of outputs ("maps") for participants to use as learning and reflection tools regarding how their activities and roles relate to and influence the system in which they participate. Conventional methods and variables of network analysis such as centrality, betweenness-centrality, and clustering coefficient were applied to systematically analyze the participants' cognitive maps. This allowed a clearer visualization of the agents' dominant narratives and actual capacity for intervention in the system (e.g., in relation to which other agents, and over which system variables).

Unlike other participatory processes that focus on material or system-level outcomes of transformations, T-Labs emphasize inside-out transformations. The system is changed "from within" through changing our relationships at the personal level (Wamsler 2019). For example, through ToS, participants can explore empathy and narratives about themselves and their relationships to others in the system (Eakin et al., 2019), using affection and compassion as well as rationality, to avoid, on one extreme, polarizing views of good guys versus bad guys, and, on the other extreme, both-sideism (i.e., the practice of finding a second angle on a story in an attempt at appearing "fair" to each side).

The problem that gave rise to the T-Lab in Xochimilco was the degradation of the lacustrine zone of Xochimilco, and the abandonment of chinampas agriculture, which is one of the most productive and sustainable systems of agriculture as originally practiced by the Aztecs (Tellman et al. 2018). This degradation is related to informal urbanization processes. Although at the beginning the participants' perceptions and interests on the system primarily identified with either one of two traditional groups of Xochimilco (agricultural producers/*chinamperos* or urban residents), the dialogues and processes that took place over the almost three years of T-lab allowed them to recognize that they share some values and meanings. They also recognized that

various worlds coexist around the urban wetland of Xochimilco (many more than two) and that since they are part of the same system, it was more important to build bridges between them than to remain divided; thus, they began to understand their respective positions, and the agricultural producers developed greater empathy for the residents of urban settlements, particularly those living in informal settlements. In some cases, there were even new collaborations across these groups and seeds were planted for future, joint actions. One of the most important results was that the participants recognized the need to “change the chip,” that is, to change from within, to change the paradigm, and thus the importance of changing the relational dynamics concerning what is happening among their neighbors and other members of the community (Ruizpalacios et al. 2019).

Moving forward

The theory of change behind ToS is that transforming systems involves transforming the relationships that the agents who inhabit and co-create the system hold with themselves and others, and that new collective actions will emerge from the new relationships. There is little doubt that the Xochimilco T-Lab, and similar participatory processes, can succeed in creating new relationships amongst participants (Pereira et al. 2020). We observed, for example, changes in the Ego-nets of participants revealing novel collaborations and alliances. These relationships persist today years after the funded project ended. T-Lab participants continue collaborating towards the system’s transformation. It is also apparent that the T-Lab changed the agents’ perceptions about the system, their position in it, as well as their values and priorities. Less clear is the extent to which the T-Lab caused or contributed to system-level transformations towards sustainability. Attributing causality in complex systems is extremely difficult. Beyond the obvious limitation that the number of participants was relatively small and that the Xochimilco wetland system is embedded in larger social-ecological systems that constrain its dynamics, it is important to consider that transformations take time. Future transformations might be seeded by T-labs, but these seeds might not be currently observable. In any case, the Xochimilco T-Lab was a proof of concept demonstrating the feasibility of ToS. It is reasonable to assume that a larger scale implementation of T-Labs across multiple scales and the constant improvement of ToS would eventually result in system-level transformations.

Overall, more research is needed about how to measure a T-Lab’s success and the effectiveness of ToS. A T-Lab should direct the participants’ attention towards their own agency, and towards realizing how their agency is embedded within, and connected to, the agency of others in social-ecological system. A key requirement for a successful T-lab is to be able to generate a supportive space that stimulates openness, emotional engagement and personal interaction.

Summing up, we presented T-Labs as participatory spaces where new agency is activated in relation to sustainability challenges. The main goal of a T-Lab is allowing collective intentions towards transformation to emerge. They are human-centered and a process of incubation of collective enterprises: groups of people who share an intention to transform a system in which they participate and that are brought together through the T-Lab, build collective agency as a

group through ToS; which can be tested and developed by universities, and engage in self-directed processes of transformation.

Acknowledgements

Many thanks to our colleagues Beatriz Ruizpalacios, Rebecca Shelton, Rodrigo García, and Patricia Pérez-Belmont, and to all the Xochimilco T-lab participants for their valuable time, effort, and interest in sharing their experiences and knowledge throughout the process. In particular to Sara Muñoz, Federico Contreras, Azael Meléndez, Enrique Lomnitz, Darío Velazco, Rubén Rojas, and Elsa Valiente. T-labs were supported in part by the Transformations to Sustainability program, coordinated by the International Social Science Council, funded by the Swedish Development Cooperation Agency (Sida), and implemented in partnership with the National Research Foundation of South Africa. The Transformations to Sustainability Program represents a contribution to Future Earth

Bios

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Citations

Archer, M. S. 2007. Making our way through the world: Human reflexivity and social mobility. Cambridge University Press.

Chambers, R. 2013. Ideas for development. Routledge.

Charli-Joseph L, Siqueiros-Garcia J, Eakin H, Manuel-Navarrete D, and Shelton R. 2018. Promoting agency for social-ecological transformation: a transformation-lab in the Xochimilco social-ecological system. *Ecology and Society* 23(2):46.

Eakin H, Shelton R, Siqueiros-Garcia J, Charli-Joseph L, & Manuel-Navarrete D. 2019. Loss and social-ecological transformation: pathways of change in Xochimilco, Mexico. *Ecology and Society* 24(3):15.

Foucault, M. 1988. Technologies of the Self: A Seminar with Michel Foucault. L.H. Martin, H. Gutman, P.H. Hutton (eds). Tavistock.

Horlings, L. G. 2015. The inner dimension of sustainability: personal and cultural values. *Current Opinion in Environmental Sustainability*, 14, 163-169

Ives, C. D., Freeth, R., & Fischer, J. 2020. Inside-out sustainability: The neglect of inner worlds. *Ambio*, 49(1), 208-217.

Manuel-Navarrete, D., & Pelling, M. 2015. Subjectivity and the politics of transformation in response to development and environmental change. *Global Environmental Change*, 35, 558-569.

Manuel-Navarrete, D., Morehart, C., Tellman, B., Eakin, H., Siqueiros-García, J. M., & Aguilar, B. H. 2019. Intentional disruption of path-dependencies in the Anthropocene: Gray versus green water infrastructure regimes in Mexico City, Mexico. *Anthropocene*, 26, 100209.

Marín, AI, Ely, A, Van Zwanenberg P. 2016 Co-design with aligned and non-aligned knowledge partners: implications for research and coproduction of sustainable food systems. *Current Opinion in Environmental Sustainability*. 20:93-98.

Meadows, D. H. (1999). *Leverage Points: Places to Intervene in a System*. Hartland, VT: Sustainability Institute. Available from:
<http://www.scrummaster.dk/lib/AgileLeanLibrary/People/DonellaMeadows/donellameadows.org-Leverage%20Points%20Places%20to%20Intervene%20in%20a%20System.pdf>

O'Brien, K. 2012. Global environmental change II: from adaptation to deliberate transformation. *Progress in Human Geography*, 36: 667-676.

O'Brien, K. 2013. The courage to change: Adaptation from the inside-out. In SC Moser and MT Boykoff. Successful adaptation to climate change, 330-343. Routledge.

Pathways Network. 2018. T-Labs: A Practical Guide—Using Transformation Labs (T-Labs) for Innovation in Social-Ecological Systems; STEPS Centre: Brighton, UK. Available from: <https://steps-centre.org/publication/t-labs-practical-guide/>

Pereira L, Frantzeskaki N, Hebinck A, Charli-Joseph L, Drimie S, Dyer M, Eakin H, Galafassi D, Karpouzoglou T, Marshall F, Moore ML, Olsson P, Siqueiros-García JM, van Zwanenberg P, Vervoort JM. 2020. Transformative spaces in the making: key lessons from nine cases in the Global South. *Sustainability Science* 15:161–178.

Ruizpalacios B, Charli-Joseph L, Eakin H, Siqueiros-García JM, Manuel-Navarrete D, Shelton R. 2019. The Transformation Laboratory of the social-ecological system of Xochimilco, Mexico City: Description of the process and methodological guide. Ciudad de México, México: LANCIS-IE, UNAM. Available from: <https://steps-centre.org/publication/the-transformation-laboratory-of-the-social-ecological-system-of-xochimilco-mexico-city-description-of-the-process-and-methodological-guide/>

Tellman, B., Bausch, J., Eakin, H., Anderies, J., Mazari-Hiriart, M., Manuel-Navarrete, D., and Redman, C. 2018. Adaptive pathways and coupled infrastructure: seven centuries of adaptation to water risk and the production of vulnerability in Mexico City. *Ecology and Society*, 23(1).

Wamsler C. (2019) Contemplative Sustainable Futures: The Role of Individual Inner Dimensions and Transformation in Sustainability Research and Education. In: Leal Filho W., Consorte McCrea A. (eds) *Sustainability and the Humanities*. Springer, Cham.