Unexpected reflections towards transformation: Second Order Learning from the Covid-19 Pandemic. Preliminary insights. Executive Summary

Figure 1: Covid-19 in one word[1]

1. Scope of this research

This research explores, within the Transformative Innovation Policy Consortium (TIPC)[2], community, **how has COVID-19 contributed to Second Order Learning --understood as changes in beliefs, assumptions, points of view and behaviours --that is relevant for transformation.**

2. Theoretical framework. Second order learning in transformative innovation

Second Order Learning and its associated understandings **is always present** in the **transitions** and in the **social change** arenas usually either as a "**steering mechanism**" (van Mierlo et al., 2020: 251) or as a "**transformative outcome**" (Ghosh et al., 2020: 10).

Transitions theory, **organisational learning** and **transformative learning in education** have a similar interpretation of what second order learning (hereafter **SOL**) is, and shared elements of how it may occur. **SOL implies changes in beliefs, assumptions, points of view** and **behaviours**[3] (Schot et al., 2019; Argyris and Schon, 1996; Mezirow, 1997).

The three strands of literature share that **unforeseen circumstances** such as **Covid-19** may induce **SOL** and that **reflexivity** is key towards **provoking it** (Schot et al., 2019; Argyris and Schon, 1996;

[1] This is the result of the ice-breaker for the first online workshop. Participants were asked to mention the first word that came to their minds when thinking about the pandemic.
[2] See the TIPC website: http://www.tipconsortium.net/
[3] According to Oxford Learner's Dictionaries, a belief is a strong feeling that something/somebody exists or is true; confidence that something/somebody is good or right. An assumption is a belief or feeling that something is true or that something will happen, although there is no proof. A point of view is the particular attitude or opinion that somebody has about something. A behaviour is the way that somebody functions or reacts, especially towards other people.

Mezirow, 1997). **Situatedness**, the involvement of the researcher and participants within a context[4], **is also considered conducive** to **frame reflection** and change (Grin et al., 2010; Ghosh et al., 2020).

In contrast, ***what*** changes varies in each literature. Transitions theories focus on ***frames***, ***assumptions***, ***rule-sets, beliefs*** and ***values*** (Schot et al, 2019). Organisational theories focus on ***strategies*** and ***assumptions*** (Argyris and Schön, 1996) and transformative learning, highlights ***frames of reference*** or ***assumptions*** including ***points of view*** and ***habits of mind*** (Mezirow, 1997). Given that the timeframe of the pandemic is still recent, this research we will focus on beliefs, assumptions, points of view and behaviours relevant for SOL. We are assuming that having **a better understanding of SOL is relevant to promote sustainability transitions** in different contexts beyond this community and that longer-term changes may take more time.

3. Methodology

A diverse sample was built including location, type of work, gender and age within the TIPC organisation including **funders and practitioners from STI agencies**, as well as **sustainability and innovation researchers**. **Sixteen persons** (from 8 countries: Chile, Colombia, Mexico, Norway, South Africa, Spain, Sweden and the United Kingdom) were **interviewed** between **May 26 and July 7**, the day when the **first virtual workshop** occurred, with **ten** of the sixteen **participants**.

Interviews focused on the impact of Covid-19 on individual, community, organisational, national and global levels to assess how **changes** in the different levels of analysis **are perceived**. While individuals are not representative of their organisation or countries, the reflexive space aimed to capture the **transformative innovation perspective** and **situated challenges** during the pandemic. The workshop opened up the space for a **broader conversation** about **STI** and **SOL**.

4. Preliminary insights (Figure 2)

4.1. Reflecting on the personal realm

While **many interviewees** (hereafter int.) **reported** that their **lives have "not changed that much**" (int. 5, 12,**15**), **daily routines became very different**: no commuting, stressed grocery shopping, intense nuclear family interaction time, a lack of social interaction, a permanent effort to feel normal, and an underlying pressure to work online as if nothing had happened, were reported.

4.2. Coping with Covid-19 effects

Some interviewees **without children** and **with broadband** reported **a slower pace**, being able to **concentrate more**, having **less activities**, **gaining commuting time**, being obliged to **stop traveling**, and being **closer to nature** as **impacts** (int. 1, 5, 7, 8, 9, 10, 12,14,16)[5]. Interviewees **with young children** work **shifts**, often instead of sleeping, **support** children's learning and **juggle** with **work interactions** instead (int.1 ,8 ,10 ,16).

[4] Sage Encyclopedia of Qualitative Research Methods, 2008: 815.

[5] Random numbers were assigned to interviewees to respect their anonymity.

Anxiety, **uncertainty** and **insomnia** are often **present** (int. 5,6, 8, 9,16)**. Being sick**, **having a job** despite the downturn, and the **future development** of **agencies**, **countries**, or the **world** stand out as worries (int.1,6,9,10, 11,14,16). Some participants dealt with **having Covid-19 themselves** while **working** and **without childcare**.

4.3. Challenges for STI agencies

Science, Technology and Innovation (STI) agencies forming TIPC are **usually not leading the health response**, but presenting **evidence against** the **Covid-19 menace** (int. 9, 12). Many members are still **crusading for STI towards a sustainable future** (int. 1, 5, 9, 11, 12,16) while defending the **allocation of financial resources** (int. 3, 4, 5, 6, 7, 12, 16).

While the pandemic has brought **visibility and reflectors** to the STI community and system, **this has not been accompanied by the deeper reflection on the type of STI that is needed to sort out national and global challenges** (int. 4,5,8,9,10,12,13,14, 15,16). New **workloads**, **roles** and **commitments** add up to previous projects (int. 5, 7, 8, 11, 15). Eleven phrases (Table 1) inspired on the interviews were taken to discuss during the workshop.

The most popular phrase commented was number 10, "**Habits and fear of something going wrong are the largest obstacles to change and transformation within the STI system**". This is consistent precisely with Mezirow's "frames of reference" and with Argyris and Schön's "feelings" usually suppressed in professional realms. The choice of the phrase closest to SOL concepts is also consistent with a more **trustworthy** and **reflexive conversation** building up.

4.4. New technological bridges and walls

Many initiatives have taken place to **provide equipment and network facilities** in different institutions (int. 2, 13). The **technological jump** may still mean **extra stress** and **unease** if an **inadequate equipment** or **internet connection** are present. Even some of the sample participants recognized having considered being "more advanced technologically than what we actually are" (int.11). Participants highlighted how **unequal access to technological services** may **increase vulnerability**, especially in the Global South (int. 9,14,15).

4.5. Global South challenges

Transitions towards a more **digital work environment** may contribute to **more social inequality** as the **technological skills gap** adds up to **the existing educational background** (int. 8, 11, 13, 14, 15). **Less transparent and open decisions may be imposed top-down** under the current circumstances (5,6, 10,11,13,14,16).

Table 1 STI phrases inspired on the interviews and used on the workshop

1. Science is still very political and there is always more than one interpretation of scientific facts. STI plurality is essential.
2. We think a lot about sociotechnical systems but there is also a need to focus on socioecological systems, nature conservation and ecologically vulnerable regions.
3. There is a very clear case for global knowledge which will make relevant progress eventually available for the entire population.
4. In certain contexts the jump towards technology may be very problematic given the very unequal access to affordable solutions.
5. Interaction between topics becomes more relevant. We are not only talking about health, but also about environment, inequality, transport. A stronger conversation between systems such as food and health may be seen.
6. Despite Covid-19, there is a lot of inertia in the system that might prevent science policy shifting more towards global challenges.
7. The pandemics shows how traditional evaluation of STI through productivity has completely failed.
8. The pandemics shows how traditional evaluation of STI through productivity has completely failed.
9. The war-like modality of STI is getting more attention, but what happens to the other part, the one where we think about how we got into this mess, how we are part of the problem instead of part of the solution?
10. Habits and fear of something going wrong are the largest obstacles to change and transformation within the STI system.
11. As STI is considered key towards a countercyclical response to economic contraction, the need for a more transformative approach becomes clearer.

5. Second Order Learning and Covid-19

Changes in **beliefs, assumptions, points of view and behaviours** associated to the **Covid-19 pandemic** seem visible after **our own reflexive process** and are consistent with the path towards **second order learning**. While not feeling a major *life shift* occurring, everyone acknowledged ***new understandings*** about life, health, home, work, context, and social interactions.

Beliefs, **assumptions** and **points of view** are surely different than before. The impact of **individual and familiar circumstances** (int. 3,4,5,8), and the **STI community** gained attention (int. 5,7,8,11,15). **Work** changed (int. 3,4,6,7,13), and is now only doable with adequate equipment, connectivity and capacities (int. 4,5,7,8,9).

Figure 2 Preliminary findings in brief

A more **complicated future** (int. 1,6,9,10,11,14,16) stirs up previous convictions about **relevant efforts towards sustainability** (int. 1,3,4,5,6,7,9,11,12,16). **New concerns** emerge about **plurality** in STI (int. 5,10,11,13,14), and about **exponentiated social, environmental and technological inequalities** (int. 2,4, 8,9,11,13,14,15). A **deeper reflection** about STI's role in global challenges is desirable but not yet present (int. 4,5,8,9,10,12,13,14,15,16). **Changed behaviours** result from **uncertainty** (int.1,6,9,10, 11,14,16), lack of **childcare** (int.1 ,8 ,10 ,16), the **abrupt shift** to online work (int. 1, 8, 11,13,14,15, 16), and lack of **in-person social interaction** (int. 3,4,5,6,7).

6. Next steps

To increase SOL in the TIPC community, participants suggested **sharing experimentation's methodologies**, **techniques** and **learnings** between **different contexts**; challenging through **experimentation** our own **underlying assumptions and beliefs**; building **more reflexive spaces** where participants feel safe; and **promoting learning and communication activities** enhancing **future imaginaries**.

Pending issues for future research involve: whether **SOL** may be **purposefully induced** or not; a **deeper understanding** of the **implications** of individuals and organisations having second order learning; and the **formulation** and **diffusion** of a **stronger narrative post Covid-19** to **promote sustainability transformation**.