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Transformative Social Innovation

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This paper presents transformative social innovation as a specific type of social innovation which attempts avoiding the trap of being used by the neoliberal mainstream. Unfortunately, utilizing social innovations to strengthen the “human face of neoliberalism” has become a real threat since the Barroso Commission has embraced social innovation as a panacea to solve the social crisis resulting from the financial breakdown in 2008. In this approach, social innovation has increasingly been reduced to a recipe of fostering social entrepreneurship and creating quasi-markets (Jenson, 2015, p. 101), thereby promoting an “enabling welfare state” which uses the creativity and personal commitment of its citizens (Bureau of European Policy Advisors, 2010: 7). In current social innovation policies, attention focuses on the space of manoeuvre of deliberate agency, often by social entrepreneurs or “change maker”, to implement “piecemeal changes” in the short run, like improving language skills of migrants or reintegrating of long-term unemployed into the labour market. Nobody can object to “doing more with less” in the form of cost-and resource efficient responses in times of ecological crisis and fiscal constraints. Nor can one oppose incentives for active citizenship in a “participation society”. However, these efforts have become increasingly problematic, as a one-sided concern with measureable social impact, offering quick and visible solutions, has impeded to reflect on the deeper causes of the current multiple crises. But without understanding causes, agency can neither grasp important dimensions of a problem nor identify potentials. It, therefore, tends to remain ineffective. This recalls the “old saying that ‘when it comes to practicality, nothing beats a good theory’” (Danermark, Ekström, Jakobsen, & Karlsson, 2005, p. 187f) – and a good theory of capitalist modernisation is prerequisite for all types of emancipatory agency.

In this paper, I will first quickly present attempts at elaborating a more radical version of social innovation that aims at tackling causes, including unequal power relations and systemic elements of capitalist market economies. Frank Moulaert and his colleagues, the research project TRANSIT and Mangabeira Unger offer different analyses for identifying the transformative potential of social innovations. Based on these contributions, I will present my understanding of transformative social innovations, grounding it in Karl Polanyi’s *The Great Transformation*, critical realism and transdisciplinarity.

1. Existing versions of transformative social innovation

Supporting the empowering and transformative dimensions of social innovation has always been stressed by the research tradition in line with Frank Moulaert who has always been fascinated with social innovations as practices that improve human conviviality in a broad sense, going beyond a materialist understanding of development and growth, aiming at “transformation of institutions, overthrowing oppressive ‘structures with power’, collective agency to address non-satisfied needs, building of empowering social relations from the bottom-up” (Frank Moulaert & Van Dyck, 2013, p. 466). Therefore, research as well as effective agency have to relate theory and practice, as action and reflection are intertwined. Social innovation research which contributes to transforming social relations needs good theories, good methods, but especially a good research design. Adequate practical knowledge and transformative social change are related and need one another.

The “International Handbook on Social Innovation” (2013) was a culmination of Moulaert’s effort to coordinate academic team work towards this type of social innovation research. In this research tradition, social innovation should not only dwell on micro-agency, but should be innovative with respect to the dominant institutional setting. Therefore, collective empowerment was considered decisive in changing social relations and satisfying needs, e.g. through participatory modes of governance and capacity building. I have accompanied this research for nearly twenty years. In our last joint project Social Polis on “Social Cohesion in the City”² we proceeded from interdisciplinary team work to deliberate efforts of transdisciplinary knowledge generation and diffusion. To “grasp the full picture” of a complex issue like social cohesion, which was the objective of Social Polis, required widening our perspectives, reframing problems and mobilising different theories and methods. Inter- and transdisciplinary research designs contribute to broadening the actor’s horizons by integrating practitioners into the research process, thereby obtaining a deeper understanding of “reality”. Social cohesion, for example, cannot be understood by one discipline, nor can it be dealt with by one policy field alone. It requires multiple perspectives and approaches to tackle the *problématique* of striking the balance

² For further information see <http://socialpolis.eu/>

between equality and diversity, belonging to a group and stressing one's singularity (Novy, Coimbra Swiatek, & Moulaert, 2012; Rosanvallon, 2013). It contextualises itself in many wicked problems, like increasing inequality and widespread social insecurity, urban degradation in the French *banlieue* or the security issues related to the refugee tragedy. Resulting challenges do not find easy answers: Which cultural traits should be respected, which prohibited; which elements of inequality foster diversity and which undermine cohesion? All these questions have to be dealt with by grasping the multidimensionality of the respective situation as well as identifying underlying causes and structural mechanisms.

In ImPRovE³, a European research project on social innovations to combat poverty, we used the Moulaert definition to analyse contemporary social innovations in the field of combating poverty. A main finding was the lack of collective empowerment strategies in Europe – differently from the two Brazilian case studies – and a focus on satisfying needs in innovative ways as well as changing micro-governance dynamics. In our 31 case studies we discovered a range of initiatives whose social impact consisted in “humanizing” a problematic situation without tackling the deep structural causes (Oosterlynck et al., forthcoming). An emblematic example is the “Energy for All” programme in Flanders which organized a micro-credit programme for energy poor households. It gave incentives for “moderate” indebtedness and opened a new business model for the financial sector, without problematizing the finance-dominated accumulation regime (Cools & Oosterlynck, 2015). This is one example of an alarming mainstreaming of social innovations in line with neoliberal European governance. Under certain conditions – for example urgent deprivation – these minimalist innovations might be positive in themselves. But it is the opposite of innovative, if they deepen path dependency of a failed socioeconomic model of radicalized competition, dismantling public institutions and social rights. Neoliberalism, like all ideologies, is not without alternative and it is a key mistake to take “modesty for realism” (Unger, 2015, p. 236), as this has often led to “dull repetition” (Sum & Jessop, 2013, p. 133) of a cost-reducing optimisation logic without changing the causes of social exclusion. “To accept the present political and economic arrangements as the unsurpassable horizon within

³ <http://improve-research.eu/>

which the social innovation movement must act, is to reduce the movement to the job of putting a human face on an unreconstructed world” (Unger, 2015, p. 236).

Another research project, TRANSIT⁴, is explicitly dedicated to transformative social innovation theory and ambitious with respect to the need of profound changes. In its research design, TRANSIT refers to three macro-dynamics – the economic crisis, climate change and ICT revolution – which have to be shaped by innovative agency. In line with a multi-level perspective, the research group distinguishes social innovation as new practices at the micro level with more profound changes resulting from system innovation, game-changers, narratives of change and societal transformation (Avelino et al., 2014, p. 9). Together these five shades of change and innovation contribute to a broader socio-economic transformation, in line with the transformation expected from a shift-away from agrarian society (Polanyi, 2001[1944]) or the current fossil energy system (WBGU, 2011). However, the link between bottom-up initiatives and the structure of capitalist market economies is elaborated only rudimentary. There is no theory of transformation, as crises phenomena are described, but not systematically connected by means of causal mechanisms. It will be up to the case studies, whether this will be achieved in the empirical research of TRANSIT. However, it will not be possible without a more systematic reflection on power and domination. To take one example. One case study is on Ashoka, which is a good case for linking local projects to transnational networks. Ashoka is also a key player in implementing “Energy for All”, studied in ImPROvE. In the case of “Energy for all”, taking a transformative perspective would imply a critical appraisal of existing strategies of promoting the poor to run into debt – from the Subprime crisis in the US to student credits in the UK. This requires awareness raising of poor households with respect to the structural causes of uneven access to public services as well as the political production of indebtedness in times, when public money is available to save bank shareholders but not ordinary citizens. For sure, this would question the existing governance models of many social innovations which are increasingly based on cooperation with business or philanthropy. But the limitations of mainstream social innovations shows the urgency of a power-sensitive conceptualisation which explores spaces of manoeuvre for empowering and emancipatory agency in adverse and conflict-ridden situations.

⁴ <http://www.transitsocialinnovation.eu/>

A third type of radical innovation has been elaborated by Mangabeira Unger. He distinguishes between minimalist social innovations which give a human face to an otherwise unsupportable situation, and maximalist social innovations that aim at deep changes. The decisive contribution by Unger consists in offering a new method of experimentalism to achieve change which differs from social democratic centralized social engineering. During post-war social-democratic welfare capitalism, social policy has been efficient as state-centred, top-down, bureaucratized and homogenizing. As this type of social engineering has been dismantled and discredited for good – and not so good – reasons (Judt, 2010), there is an urgent need for a new progressive method for transformation that links visionary thinking of “another world” with actual reality and pragmatic, often grassroots agency in a way that is practically-adequate. Unger proposes experimentalism as a double undertaking, radical and reformist. To deal constructively with such a dialectical approach of small-scale and long-term transformations requires “maximalist” social innovations, “piecemeal and gradual in method but nevertheless radical in ambition” (Unger, 2015, p. 239).

This section has presented different types of radical and transformative social innovations. In the next session, I will elaborate a proper type of transformative social innovation based on an ontology that perceives reality as in a constant process of becoming and emerging.

2. Transformative social innovation based on critical realism, transdisciplinarity and utopian thinking

The ongoing epochal changes must not be confounded with minor cyclical crises, but have to be compared to the secular transition from an agrarian to an industrial society (WBGU, 2011). Not only structural unemployment, climate turmoil or the ongoing debt crisis, but also the rise of right-wing extremism, nationalism and European disintegration show the deep crisis of our “imperial mode of living” (Brand & Wissen, 2017). Transformation, in the understanding of Polanyi (2001[1944], p. 44), is not a small change in appearance, but a profound change in form, comparable to the morphogenesis from a caterpillar to a butterfly. Although the same animal, the emergence of a butterfly reflects a profound change in form. The same is true for socio-economics: Introducing an industrial market society led to profound social upheaval,

fascism, communist revolutions and war. Implementing a post-fossil energy system with new geoeconomic centres in an age of digitalisation will result in a profoundly different socio-economic system. To better understand these transformations requires a process-oriented philosophy of science based on a procedural understanding of reality, nature and society – as opposed to a naturalisation of the existing order.

Conscious collective transformation means learning to change social forms, institutions, discourses and ways of living (Jaeggi, 2014). “[T]he point of all science, indeed all learning and reflection, is to change and develop our understandings and reduce illusion. ... Learning, as the reduction of illusion and ignorance, can help to free us from domination by hitherto unacknowledged constraints, dogmas and falsehoods.” (Sayer, 1992, p. 252). With respect to apparently problematic situations, like urban degradation, unemployment or intercultural conflicts, it is important to know the “fundamental social relations without which this phenomenon would cease to exist”. Instead of solving predefined problems, there are – in a more neutral language- phenomena which have to be understood and potentials to be identified and mobilised: Unemployment due to productivity increases might be transformed into a blessing with working time reductions; migration might be re-interpreted as a growth potential instead of a security threat, poverty might offer insights in a sustainable way of live. Creating the context in which the potential of a concrete situation becomes actualised, goes in a creative way beyond the “actually existing”. In a complex setting with an unclear definition of phenomena, social innovation should be about redefining problems by reframing and stressing potentials instead of merely pointing at problems, thereby, creating a different “reality”.

Critical realism as an embracing philosophy of science insists that there is a reality which exists independently from our observation and conceptualisation of it. But reality has to be approached critically and with adequate concepts, as the real world is more than our description of it (Danermark et al., 2005, p. 5). The concept “poverty”, observable and measurable via indicator, must not be conflated with the actually existing and empirically observable reality of a complex phenomenon of deprivation, alienation, humiliation and oppression.

Critical realism as well as a maximalist and radical understanding of social innovations have their ideational origins in the progressive mood of the 1960s, perceiving the future as open. Their utopian aspiration resides in a wide horizon that

goes beyond the status quo, based on the dreams and hopes for a better live (Bloch, 1959, p. 1). As reality covers what exists at the moment as well as the potentially emerging, critical realism conceptualises the potential of a problematic situation as part of reality, broadening the scope of “realism” and “pragmatism” in policy making. From a critical realist perspective, the currently dominant type of social innovation research and policy has to be criticised for reducing reality to the actually existing, often focussing on empirically observable symptoms and excluding potentially progressive futures. Against all claims of “There is no alternative” one has to insist on the openness of the world and the pulse of freedom which must not remain trapped in superficial or even ineffective adaptations of existing mechanisms (Hartwig, 2007). Thereby, critical realism emphasises the (positive and negative) potential of human agency for path shaping and opens a whole universe of emerging futures.

'The real' is neither limited to empirically observable nor the actually existing phenomena, but constitutes also the underlying, non-observable mechanisms that can cause events in the world. Reality – being observable or not – structures constraints and opportunities for the involved agents which, therefore, act not in a voluntaristic way, but strategically. Identifying key mechanisms in scientific research is not only good theory, it is highly relevant for exploring the space of manoeuvre for strategically acting differently. Therefore, a focus on structures as both enabling and disabling (cf. Hay 2002, p. 89ff.) is a prerequisite for good social innovation research that neither over- nor underestimates the potential of agency. “Social structures are always the context in which action and social interaction take place, at the same time as social interaction constitutes the environment in which the structures are reproduced or transformed.” (Danermark et al., 2005, p. 181). Good social research explains the basic functioning of a society which presupposes empirical regularities as well as non-observable mechanisms. The latter can only be grasped with adequate concepts and models.

In TRANSIT, for example, there is a lack of relevant abstractions to grasp the linkages between the economic crisis and climate change. In current neoliberal capitalism, for example, the growth and profit imperative constrains collective agency and facilitates consumerism, favouring exchange value over use value. These concepts would help to explain the systemic neglect of ecological concerns as well as the ongoing pursuit for short-sighted and mono-functionalist competitive advantages. They would help to understand the powerful dynamics leading to the economisation of social

services and the subordination of the multi-dimensional use value of caring, nurturing and solidarity to a mere by-product of successful economic activities. Socially innovative initiatives increasingly suffer from structural constraints, resulting from austerity or competitive tender procedures. Ignoring these constraints underestimates the power of centralisation and profit-making in market societies with its disastrous consequences on the human fabric, described historically by Polanyi (2001[1944]), and currently by Crouch (2015) and Streeck (2016).

Furthermore, visions, imaginaries and utopia are not “un-realistic” – as often denominated in everyday speech -, but decisive for structuring effective transformative agency towards the path of emancipation and sustainability. Socially innovative agency has to experiment how to overcome the destructive and self-restraining dualism of incremental and radical change. The latter has so far impeded the effective mobilisation of the marvellous constructive energies of small-scale bottom-up initiatives, as neither can neighbourhoods alone save the city (Frank Moulaert, Swyngedouw, Martinelli, & Gonzalez, 2010), nor can transition towns alone avoid climate catastrophies. Micro-social innovations must not fall into the localist trap and overlook that small scale projects remain “part of the game”.

To deal with the tension of reform and revolution, superficial and profound changes in a constructive way, the concept of concrete utopia, as the anticipation of a potentiality, is helpful. Ernst Bloch (1959, p. 1625) proposes the concrete utopia of a classless society as the “tendency-latency” (Tendenz-Latenz) of a genealogical process. Based on the remembrance of homeland and home (*Heimat*) in childhood, he imagines a future which incipiently already exists and is known. During the “golden age of capitalism”, welfare capitalism and universal social security created incipient elements of a society of equals (Judt, 2010) – territorially restrained, with unequal gender relations and based on an unsustainable economic system. In continuation of Bloch’s vision of a flourishing society, the concrete utopia of the good life for all aims at the free flourishing of everyone as the condition of the free development of all (Marx & Engels, 1977 <1848>, p. 482). Given the actual world based on hunger, exploitation and violence such a vision seems “unrealistic”. But taking the Human Development Report 2016 on *Human Development for everyone* (UNDP, 2017), one perceives that real progress towards a world without misery has been made and that the utopia of universal flourishing can be translated into feasible steps – like the sustainable development goals

(SDGs). Overcoming hunger and misery by strategic discretionary agency is possible – and it should be a key target for all types of social innovations.

Concrete utopias propose feasible steps of actualizing potentials by also opening up a comprehensive horizon beyond capitalism. Utopias, visions and imaginaries provide guidance for reformist strategies that can be effective in the short-term within the existing order, but open the horizon for more radical change. “As a guiding principle, the utopia of a good life for all avoids the dualism of reform and revolution, of small steps within the existing order and major advances of radical change” (Novy, 2014, p. 5). It is reformist with respect to the short-term objective of avoiding a deepening of neoliberalism as well as a spread of nationalism and racism. Bottom-linked transformative agency valorizes effective pragmatic first steps in direction of radical change foreshadowing a different future. “Such steps are moves in the penumbra of the ‘adjacent possible’ surrounding every state of affairs: the ‘theres’ to which we can get from here, from where we are now, with the materials at hand ... Only because the piecemeal can be the structural can the social innovation movement do its work.” (Unger, 2015, p. 242). But these utopia-inspired experimental changes must not be reduced to a bottom-up and project-centred approach. Transformative social innovation is aware of structural constraints and the power of dominant interests which require a type of Luxemburg’s revolutionary Realpolitik (Haug, 2007), recently called double transformation (Klein, 2014), thereby contributing to the “reflexive transformation of structure by agency” (Sum & Jessop, 2013, p. 49).

Exploring alternatives requires a specific democratic governance of knowledge and an epistemology “understood as an interactively unrolled manual on how to connect questions about social change to scientific interrogation” (Frank Moulaert & Van Dyck, 2013, p. 467). Transdisciplinarity helps to overcome initial, often limited and superficial problem definitions. By organizing time, space and resources, it offers space for dialogue and deliberation to jointly re-define problems and elaborate a research programme (Cassinari et al., 2011; Novy, Habersack, & Schaller, 2013). I will finish by giving one example: To reduce the political to state agency depoliticizes all efforts to democratize the social-ecological transformation, be it the energy transition or new forms of mobility. The state is not the actor that introduces the new “from above”. Transformative social innovations emerges in bottom-linked governance models. For the individual, it broadens freedom, not in the sense of increasing the freedom to

choices, but as the capacity of voicing alternatives and shaping one's own way of living. It is based on democracy as a form of life, on participation and public involvement in the community and public affairs. It is the *Gemeinwesen*, be it the polity, local community or the broader commonwealth, which creates the infrastructure and institutions which hinder and enable agency: bicycle lanes or motorways, local markets or shopping malls, free access to the internet or big-data controlled social media. Only such a broad concept of the political, which includes state as well as civil society agency, allows the transition movement and other alternative social movements to make sense of their piecemeal initiatives as steps towards systemic transformations. Social innovations often emerge from civil society. But the state, its legislative, bureaucratic and tax-collecting power, remains a nodal point in enabling civil society. Experimenting with new forms of political agency and democratic governance is of utmost importance for socio-economic transformation. Political – in its original meaning – is about shaping the common wealth, its laws and institutions. Politicising – in small steps - transformative agency as a collective undertaking of overcoming the deep logics of exploitation, consumerism, endless competition and the growth imperative is the major challenge of our times. Transformative social innovation has much to contribute.

Bibliography:

- Avelino, F., Wittmayer, J., Haxeltine, A., Kemp, R., O'Riordan, T., Weaver, P., . . . Rotmans, J. (2014). Game-changers and Transformative Social Innovation. The Case of the Economic Crisis and the New Economy. *TRANSIT working paper*. Retrieved from
- Bloch, E. (1959). *Das Prinzip Hoffnung*. Frankfurt/Main: Suhrkamp.
- Brand, U., & Wissen, M. (2017). *Imperiale Lebensweise. Zur Ausbeutung von Mensch und Natur im globalen Kapitalismus*. München: oikom.
- Cassinari, D., Hillier, J., Miciukiewicz, K., Novy, A., Habersack, S., MacCallum, D., & Moolaert, F. (2011). Transdisciplinary Research in Social Polis. Retrieved from www.socialpolis.eu website:
http://www.socialpolis.eu/uploads/tx_sp/Trans_final_web_double_page.pdf
- Cools, P., & Oosterlynck, S. (2015). *Case Study 13: Energy poverty and social entrepreneurship: strengthening pre-financing models for energy efficient electrical appliances through the 'Energy for All' programme*. Retrieved from Antwerp:
- Crouch, C. (2015). *The Knowledge Corrupters. Hidden Consequences of the Financial Takeover of Public Life*. Cambridge: Polity.
- Danermark, B., Ekström, M., Jakobsen, L., & Karlsson, J. C. (2005). *Explaining Society. Critical realism in the social sciences*. London and New York: Routledge.
- Hartwig, M. (Ed.) (2007). *Dictionary of Critical Realism*. London: Routledge.
- Haug, F. (2007). *Rosa Luxemburg und die Kunst der Politik*. Hamburg: Argument.
- Jaeggi, R. (2014). *Kritik von Lebensformen*. Berlin: Suhrkamp.

- Jenson, J. (2015). Social Innovation: Redesigning the Welfare Diamond. In A. Nicholls, J. Simon, & M. Gabriel (Eds.), *New Frontiers in Social Innovation Research* (pp. 89-106). Hampshire: Palgrave Macmillan.
- Judt, T. (2010). *Ill fares the land*. London: Penguin Group.
- Klein, D. (2014). Doppelte Transformation. In M. Brie (Ed.), *Futuring - Perspektiven der Transformation im Kapitalismus und über ihn hinaus* (pp. 101-125). Münster: Westfälisches Dampfboot.
- Marx, K., & Engels, F. (1977 <1848>). Manifest der Kommunistischen Partei *Marx-Engels-Werke (MEW)* (Vol. 4, pp. 459-493). Berlin: Dietz.
- Moulaert, F., MacCallum, D., Mehmood, A., & Hamdouch, A. (Eds.). (2013). *The International Handbook of Social Innovation. Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham: Edward Elgar.
- Moulaert, F., Swyngedouw, E., Martinelli, F., & Gonzalez, S. (Eds.). (2010). *Can Neighbourhoods Save the City? Community Development and Social Innovation* (1 ed.). Abingdon, Oxon: Routledge
- Moulaert, F., & Van Dyck, B. (2013). Framing social innovation research: a sociology of knowledge perspective. In F. Moulaert, D. MacCallum, A. Mehmood, & A. Hamdouch (Eds.), *The International Handbook on Social Innovation* (pp. 466-479). Cheltenham: Edward Elgar.
- Novy, A. (2014). *Shaping the Great Transformation: Implications for Europe*. Retrieved from Vienna:
- Novy, A. (forthcoming-2017). Transformative social innovation, critical realism and the good life for all *Making a case for social innovation*.
- Novy, A., Coimbra Swiatek, D., & Moulaert, F. (2012). Social cohesion: a conceptual and political elucidation *Urban Studies*, 49(9 (July)), 1887 - 1903.
- Novy, A., Habersack, S., & Schaller, B. (2013). Innovative forms of knowledge production: Transdisciplinarity and knowledge alliances In F. Moulaert, D. MacCallum, A. Mehmood, & A. Hamdouch (Eds.), *The International Handbook of Social Innovation. Collective Action, Social Learning and Transdisciplinary Research* (pp. 442-452). Cheltenham: Edgar Elgar.
- Oosterlynck, S., Novy, A., Kazepov, Y., Cools, P., Saruis, T., Leubolt, B., & Wukovitsch, F. (forthcoming). Improving poverty reduction: lessons from the social innovation perspective. In B. Cantillon, T. Goedomé, & J. Hills (Eds.), *Improving poverty reduction in Europe. Lessons from the past, scenarios for the future*. Oxford: OUP.
- Polanyi, K. (2001[1944]). *The Great Transformation. The Political and Economic Origins of Our Times*. Boston: Beacon Press.
- Rosanvallon, P. (2013). *The Society of Equals*. Cambridge: Harvard University Press.
- Sayer, A. (1992). *Method in Social Science: A Realist Approach* (2 ed.). London: Routledge.
- Streeck, W. (2016). *How Will Capitalism End?: Essays on a Failing System*. NewYork: Verso.
- Sum, N.-L., & Jessop, B. (2013). *Towards a Cultural Political Economy. Putting Culture in its Place in Political Economy*. Cheltenham: Edward Elgar.
- UNDP. (2017). *Human Development Report 2016: Human Development for Everyone*. New York: UNDP.
- Unger, R. M. (2015). Conclusion: the Task of the Social Innovation Movement. In A. Nicholls, J. Simon, & M. Gabriel (Eds.), *New Frontiers in Social Innovation Research* (pp. 233-251). Basinkstoke: Palgrave.
- WBGU. (2011). *Hauptgutachten. Welt im Wandel: Gesellschaftsvertrag für eine Große Transformation* W. W. B. d. B. G. Umweltveränderungen) (Ed.)

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