

Tipping Points. Deep Roots and Contemporary Challenges in Psychology



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Abstract As an object of study, tipping points raise several questions for psychology. Unless one wants to use this term as a generic metaphor to indicate sudden change, any attempt to better define this concept has to take into account some fundamental psychological features including acceptance, promotion or resistance to change, the relationship between quantitative and qualitative transformations, the dynamics between individual, social and societal levels, and the relationship between psychological and environmental changes. All these facets refer to classical approaches and theorisations developed in the early 1900s as well as to more recent systemic models, including societal and cultural psychology approaches and proposals for a socio-ecological psychology. In this chapter, we will identify points of contact with classics such as Insights and Dynamics of field forces, Cognitive dissonance, Grievance, Bounded rationality, Coping, and Socio-dynamical approaches to social representations. Moreover, looking at the recent literature, we will highlight advances in our understanding of tipping points provided by cognitive, socioecological and systemic models. Common to all these views is the attempt to describe and explain the processes that favour or hinder qualitative transformation, both in terms of its perception and its enactment. In this chapter, we will provide an overview of the different approaches mentioned, which should be read more as an agenda for future research rather than an exhaustive review of state of the art.

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1 Background

Change has always been a central theme in psychology, whether understood as a linear development, a stadial process, or a radical and sudden transformation.

Early examples of a radical and qualitative transformation in individuals' psychological states can be found in crowds and masses psychology. These early theorisations—nowadays largely revised—assumed that a change in the social context could trigger a qualitative shift in individuals. The contagion in the crowd, its stream, its inclinations were considered to be able to transform the 'normal' and 'rational' functioning of the human being either in a regressive or in an imitative key: "an individual immersed for some length of time in a crowd in action *soon finds himself in a special state* [emphasis added], which much resembles the state of fascination in which the hypnotised individual finds himself in the hands of the hypnotiser." (Le Bon, 1947, p.11). Can't we consider this qualitative state change as the result of a tipping point?

In the next paragraphs we will first offer some insights into the contribution psychology has provided to understanding processes of sudden and qualitative transformations. Moving from the individual to the societal levels of analysis, we suggest that concepts derived from research on trauma, gestalt psychology, cognitive approaches to resistance to change, and social representations, that for space reasons we can only introduce here, are at the basis of proposals that directly address tipping points. In the second part of the chapter we will describe current models that explicitly refer to tipping points, conceptualised at the individual level as the sudden emergence of patterns of meanings, and at the societal level in terms of systemic and socio-ecological psychology. We will accompany the chapter with a few examples of how these mechanisms relate to energy transition issues, and relevant to the research presented in the second part of the book.

1.1 Traumatic Changes

A foundational reflection in psychology—which we can just briefly recall here—comes from studies on trauma and self-defence.

Trauma is an event or series of events that cause an extremely stressful experience, which can leave a person with long-term psychological disorders. Traumatic events can be physical, such as a car accident (or a grenade such in the early studies on post-traumatic stress disorder, PTSD), or emotional, such as abuse or a significant loss. Studies on trauma focus on how people react and recover from these events and how professionals can offer support and treatment to those affected.

Environmental events, including natural disasters such as hurricanes, tornadoes, floods, earthquakes, and fires, can also cause trauma. Direct or mediated traumatic experiences include the destruction of one's own home and community, losing possessions and loved ones, and being forced to evacuate or live without necessities for an extended period. This can lead to long-term psychological disorders such as PTSD and depression. Other examples of environmental trauma may include exposure to pollution, experiencing an oil spill, or dealing with the aftermath of a nuclear accident.

A number of self-defensive processes are enacted to cope with traumatic and potentially dangerous conditions. Concerning environmental events, self-defence encompasses a range of actions individuals and communities can take to prepare for, respond to, and recover from environmental hazards to protect themselves, their property, and their communities from harm. For example, in the case of a natural disaster such as a hurricane, self-defence may involve preparing for the event by stocking up on emergency supplies, creating an evacuation plan, and securing one's home and property. During the event, self-defence may involve taking shelter and staying safe during the storm. After the event, self-defence may include cleaning up and repairing one's home and seeking help and support from government agencies, non-profits, and community organisations to recover and rebuild. Self-defence may also involve taking legal action to hold corporations or governments accountable for environmental damage caused by their activities. In the case of an oil spill, self-defence may involve pressuring the responsible party for a clean-up and compensation and taking preventive measures to avoid future spills. In summary, in relation to environmental events, psychosocial studies on trauma and self-defence aim to understand how negative experiences can affect people's lives and how they can be overcome through enacting behaviours, acquiring skills and implementing techniques for managing stress and dangerous situations.

The concept of self-defence is strictly connected with coping processes. Coping studies, however, go beyond behavioural responses and include psychological mechanisms which foster (e.g. self-efficacy) or hinder (e.g. denial and inaction) behavioural coping and effective mitigation and adaptation responses. As for other crises, the dramatic effects of environmental change affect individual and social well-being, disrupt social relations, and contribute to feelings of anxiety and loss of confidence in the future. The capacity and efficacy of psychological and behavioural coping responses come to the forefront. With a focus on coping strategies, the psychology of emergency deals with sudden and radical environmental changes (e.g. earthquakes, floods), trying to prevent disruption and restore a sense of continuity, power, and meaning.

Psychological, social, and cultural resources are necessary to support and promote individual and community well-being not only in the immediate aftermath of destructive events but also before and in the medium terms after the shock. Emergency psychology stresses that the systemic dimension is also relevant for coping and empowerment. The actors to be taken into consideration are not only those who directly suffer from traumatic change but also their micro, meso and macro systems (i.e., family, friends, neighbours), including also those who are

external to the context but are asked to intervene and are thus exposed to high levels of stress (Taylor & Frazer, 1982).

1.2 Restructuring the Phenomenological Field

From a different standpoint, the Gestalt school is a second classic approach that deals with qualitative change. Gestalt doesn't look only at traumatic contextual changes, but connects individual and contextual forces, perceptions and actions in a broader and systematic way. Gestalt treats concepts such as figure-ground perception or insight learning as processes of a general restructuring of the phenomenological field. In Köhler's experiments, a re-organization of the perceptual field happens in primates, making it possible to qualitatively transform the quality of objects (e.g. from boxes into steps, from two sticks into a long pole) and to reach the bananas hanging high above the cage. In the observation of children, it's the change in structure and direction of external and internal barriers that foster or obstacle the mobilisation of individual forces. For example, just by declaring 'it's playtime', children change their perception of context, which qualitatively changes the sofa into a castle or a space shuttle. Seen from the perspective of Lewin's dynamic theory, these are radical changes in the field that foreshadow a qualitative and not just quantitative transformation of its perceptual properties and the behavioural opportunities it offers (Lewin, 1935).

1.3 Cognitive and Affective Resistance to Change

Nowadays, 40 years of social cognition led to the development of robust bodies of knowledge concerning the nature of mental representations (e.g., schema, scripts, typologies of memory) and their role in guiding information processing and behaviour. Social cognition models often assume that human beings consciously and unconsciously avoid or resist to change. In this perspective, biases, heuristics, and specific needs (e.g. need for closure) are often invoked as basic mechanisms of individual cognition. Their main function is to save cognitive resources, leading humans to prefer stability and simplicity (of thoughts, attitudes, and behaviours) over complexity and change. As a counterproof, cognitive dissonance—that is, the awareness of holding two opposite beliefs or of having behaved inconsistently with one's beliefs—is often considered one of the main drivers for seeking new information or restructuring one's own beliefs, attitudes or behaviours so to reach internal consistency again.

Within this perspective, in environmental psychology, several processes have been identified that act as veritable barriers to perceiving and enacting change (see Du Nann Winter & Koger, 2004). A radical transformation, to be effective, should thus be able to overcome these dragons: *Limited cognition* (e.g., Ancient brain,

Ignorance, Environmental numbness, Uncertainty, Judgmental discounting, Optimism bias, Lack of perceived behavioural control/ self-efficacy); *Ideologies* (e.g., Worldviews; Suprahuman powers; Technosalvation; System justification); *Comparisons with others* (e.g., Social comparison and norms; Perceived inequity); *Investments in money, time, previous behaviours* (e.g., Sunk costs, Behavioural momentum, Conflicting values, goals, and aspirations); *Discredence* (e.g., Mistrust, Perceived program inadequacy, Reactance, Denial); *Perceived risks* (e.g., Functional, Physical, Financial, Social, Psychological, Temporal risks); *Limited behaviour* (e.g., Tokenism, Rebound effect) (Gifford, 2011; Gifford et al., 2011).

Adding to these, emotions, motivations and drivers have been highlighted as regulators of cognition. The renewed attention towards deep motives and emotional drivers proved useful in understanding some counter-intuitive aspects related to individual and collective responses to crises.

For example, self-serving bias in causal attributions or systematic errors, such as the “just world hypothesis”, would not only save cognitive resources but respond to deeper psychological motivations. The just world hypothesis postulates that we all tend to believe that “good people” have nothing to fear while bad events occur to “bad people”. This process not only serves to maintain a sense of stability but also to project outside of the self the responsibility of negative outcomes resulting from our own behaviours, and to feel in control through an irrational phantasy that nothing negative can happen to those who behave correctly, especially to ourselves.

As Joffé suggests, these tendencies are coherent with the psycho-dynamic interpretation of the projection of the ‘bad’ outside the self and Douglas’ social anthropological theory of the response to danger. In summary, the illusion of stability, of being able to control change, of being sheltered from transformations that we perceive as traumatic would be the result of individual foundations of the self, which are embedded in the western society cultural milieu: “From infancy to later life there is a rearrangement in people’s representations of themselves and others in accordance with the struggle for a sense of control. The subjective management of anxiety is a relational process in which the self continuously strives for protection. The taking on of certain and not other representations, of the self and others, in relation to threatening phenomena, relates to a self-protective motivation.” (Joffé, 1996, p. 208).

1.4 Placing Change in the Social Representations and Cultural Context

Contributions such as Joffé’s are relevant because they bring us closer to a systemic psychology reading of the change, in which individual—even unconscious—dynamics are read within the cultural contexts. Her reference to *social representations* points to the continuous and culturally situated meaning-making process, which defines who we are (the so-called personhood and identities) and our

relationships with others, human and non-human. In this perspective, symbols, metaphors, and images that circulate and compete in the public arena come to the forefront as rhetoric tools and communicative mechanisms through which change as an object is managed, familiarised, and endowed with meaning. Pivotal is the use of language which contributes to define the connotation of events (e.g. is it a risk or an opportunity?), the representations of self and others engaged with the issues at stake, and the pragmatic orientation which the individual and collective actors expect.

This latter way of addressing change is at the core of cultural, discursive, narrative, and socio-constructivist approaches to change in psychology (Contarello, 2022). Stability and transformation, in these perspectives, are emerging properties of communicative exchanges through which individuals and communities attribute meaning to novelties, manage them and make them more or less threatening.

The theory of social representations, in particular, has been largely used to examine how environmental issues are subject to negotiation, anchoring processes, selection of information, decontextualisation, simplification and neutralisation, and processes of cognitive polyphasia (i.e. the simultaneous use of different type of knowledge to make sense of specific social objects) (Castro, 2015; Provencher, 2011; Rouquette et al., 2005). In this regard, different representations are connected with group belongings, adherence to ideologies and cultural worldview. The transition discourse becomes not only a way to know the world but also and above all, a way to impose hegemonic ideological vision or to contrast and reverse them (Amari et al., 2016; Brondi et al., 2014, 2016; Norton et al., 2022; Sarrica et al., 2018). Even attention becomes a tool for social regulation: “not only does society affect what we habitually inattend, but it also tells us what we ought to actively disattend” (Zerubavel, 2015, p. 60).

Denial mechanisms should be intended not only as individual cognitive processes, but as social organized strategies. An example are the tendencies to accept pro environmental discourses, until they call for deeper and radical changes of the capitalistic system such as the one connected with de-growth or even of personhood, such as the one called by the Gink movement (green inclination no kids). These mechanisms play a decisive role in the orientation in the face of crises, including the environmental ones (Lima & Castro, 2005; Witt et al., 2013).

A further theoretical approach in line with the theory of social representations is that of cultural psychology.

According to cultural psychology, the individual and the context are inextricably linked and cannot be understood separately. The individual behaviours and cognitions are shaped by the cultural context in which they live, including the beliefs, values, norms, and practices of the culture. At the same time, individuals also shape their cultural context through their own behaviour and cognition. This mutual shaping of the individual and the context is known as the “person-context” relationship.

One key principle of cultural psychology is that culture is not just a set of external factors but is also internalised by individuals through their experiences and interactions with the culture. This internalisation of culture is known as enculturation, and it shapes the individuals cognitive and behavioural processes, including

their perception, memory, reasoning, and emotions. For example, research has shown that the way people perceive and experience emotions are shaped by the culture in which they live.

Another principle of cultural psychology is that culture is not a monolithic entity but consists of multiple and diverse cultural practices, beliefs and values. This means that individuals within a culture may have different experiences, beliefs and behaviours depending on their specific subculture, social class, gender, race, religion, etc. It is essential to be aware of these nuances when studying the person-context nexus.

When looking at transformation from a cultural psychology perspective, the three-level model of the social context proposed by Mantovani (1996) is a useful framework. The model consists of three levels of analysis: the micro-level, the meso-level, and the macro-level. Each level represents a different aspect of the social context and how it influences the individual.

The micro-level of analysis focuses on how an individual behaviours and cognitions are shaped by personal characteristics, such as personality, abilities, and past experiences. This level of analysis also includes the individuals immediate social context, such as their family, friends, and immediate social interactions.

The meso-level of analysis focuses on how groups shape individuals' behaviours and cognitions. This level of analysis includes the norms, values, and beliefs that are shared in a given group and their influence on group members.

The macro-level of analysis focuses on how individuals are shaped by the larger societal context, including laws, policies, and institutions that shape the culture of the society. This level of analysis also includes the broader historical events and cultural traditions that have shaped society.

According to Mantovani, the three levels of analysis are interrelated and interact with each other. A change in the norms and values would shape an individual behaviours and cognitions at the meso-level and activate loops of reciprocal influence also with the broader cultural and historical context at the macro-level.

1.5 A Tentative Summary of Psychological Factors to Be Considered

As it is possible to notice already from this extreme synthesis of the main constructs through which gestalt, social, environmental, constructivist and cultural psychology read qualitative change, a common assumption is that it has a subversive nature. Rather than unfolding incrementally, as the results of small adjustments to pre-existing patterns and/or representations, qualitative change occurs when established cognitive and discursive structures are no longer able to respond to the fundamental functions of understanding and managing reality. Traumatic situations, a profound transformation of the perceptual field, elements that are too dissonant to be managed through polyphasic processes, require a radical transformation of our

relationship with our surroundings in both symbolic and behavioural terms. These situations are outside that sphere of reality that is everyday life, and test our resilience, reaction and adaptation capacities (Axia, 2006; De Piccoli, 2007). However, each disruptive change is followed by an attempt to recover the stability and predictability of a system of reference within which individual and groups behaviour and goals are conceivable. That is, to recover that “known, controllable, non-problematic dimension of existence [in which] we feel at home, that is, in a relationship with the environment that sustains and favours adaptation, also understood as psychosocial well-being” (Emiliani, 2008, p. 9). It is precisely in this tension between extra-ordinariness and everydayness that qualitative transformations can be examined.

It is clear that these radical transformations require resources at different levels. Cognitive psychology teaches us that human beings act cognitively as resource economisers, bending their perception of reality to their prior knowledge (much more than we like to imagine). In parallel, at the societal level, social representations and cultural models are all the more effective the more invisible and ‘normal’ they become. It therefore takes cognitive and cultural resources, skills and power to be engaged in order to make oneself again at home in a radically changed world. In this regard, the difficulties in processing trauma, the choice of non-adaptive forms of coping, signal precisely the difficulty (sometimes the obstacle) to mobilising the necessary resources. As a result individuals and groups often engage in processes aimed at avoidance, resistance, adaptation to and mitigation of changes. As summarized in many recent reviews (Caillaud, 2016; Gifford et al., 2011; Smith & Joffe, 2013; Swim et al., 2011), individuals easily engage in symbolic coping responses that fulfil motivational needs (e.g., sense of control, positive identity) without, however, having a significant impact on the materiality of environmental degradation (Uren et al., 2019). Psycho-social variables such as values, beliefs, and norms are as fundamental as individual factors such as perceived control and non-conscious habits to activate behavioural coping responses (Kaiser et al., 2005; Klöckner, 2013; Stern et al., 1999).

A preliminary summary of how we might look at different types of social-ecological tipping events and connected tipping-points, therefore, includes processes of attention and perception, behavioural and symbolic coping mechanisms, pragmatic and ideological facets of communication, resources that individuals and communities have and believe they can put in place.

In sum, we suggest that what Swim et al. refer to as climate change can be easily extended to other typologies of crises, including the radical crisis activated by social-ecological tipping events:

Adapting to, and coping with, climate change is dynamic; it involves many intrapsychic processes that influence reactions to (and preparations for) adverse impacts [...]. Some relevant psychological processes include sense-making; causal and responsibility attributions [...]; appraisals of impacts, resources, and possible coping responses; affective responses; and motivational processes related to needs for security, stability, coherence, and control. These processes are influenced by media representations of climate change and by formal and informal social discourse that involves social construction, representation, amplification, and attenuation of climate change risk and its impacts. [...] Individual and

cultural variation influence all aspects of the process, providing context, worldviews, values, concerns, resilience, and vulnerability (Swim et al., 2011, p. 244)

For our purposes, certainly, the extensive body of research that has dealt with the ecological crisis provides numerous cues that can be transferred to our understanding of the social-ecological tipping point connected with decarbonisation processes. However, there is still a dearth of research that directly connects these dots with the social-ecological framework and with tipping points in particular.

2 Current Insights on Tipping Points

2.1 *Tipping Points as a Transformation in Perception, from Noise to Signal*

A first relevant programme of research is trying to define tipping points by looking at a qualitative transformation in perception and at the variation due to time and valence of stimuli.

The line of research developed by Ed O'Brien and his team is rooted in studies on perception of streaks, change perception, and impression updating. It aims to identify the basic psychological processes underlying tipping points (O'Brien, 2020). Taking a human information processing stance, the tipping point can be defined as "the point at which people begin to perceive noise as signal" (O'Brien & Klein, 2017, p. 161). In this extremely synthetic and effective definition, we can identify both the qualitative transformation and the active role that individual and situational forces play in shaping their perception. The line of research activated from these premises is mainly based on an experimental behavioural paradigm and provides relevant and promising findings and a better understanding of individual processes. However, in order to apply tipping point conceptualisation to more complex and societal phenomena, it is necessary to refer to other approaches and levels of analysis. We will therefore limit here to mentioning two results that seem to us most relevant.

A first basic process, which could also be relevant to understand social and societal dynamics, and which is coherent with well-established paradigms such as the prospect theory, is the asymmetry of valence. In the experiment conducted by O'Brien and Klein (2017), a few failures (e.g. poor grades, poor sport performances) led participant to diagnose a loss in individual capacities yet the same amount of positive results was considered not enough informative. According to this process, "People reach their tipping point more quickly when they are evaluating evidence for possible decline than when they are evaluating evidence for possible improvement" (O'Brien, 2020, p. 56). In other terms, a few negative pieces of evidence are considered much more informative and lead more easily to conclude about having reached a tipping point. Perceiving a positive tipping point might thus prove to be much more difficult. Going beyond results, these evidences seem to suggest that, for

example, an institution that wants to support the idea that a given policy has led to a positive tipping point has to consider deploying many more resources to convince citizens than those deployed by detractors.

A second basic process in the perception of tipping points is the asymmetry across time: “People predict slower tipping points than they express, regardless of valence” (O’Brien, 2020, p. 59). This means that when we imagine a tipping point, we anticipate needing much more than what’s actually necessary. For example, to change an idea, less evidence and information are required than what we think. It seems an optimistic view for those aimed at changing the community: it’s more difficult to think about change than to do it.

2.2 *Dynamical System Psychology*

Moving from cognitive processes to social transformations, as a second point of reference, are the contemporary developments in dynamical system psychology. This literature is more directly connected with studies on processes and dynamics of change, and in particular with the systemic approaches pioneered by von Bertalanffy.

The General System Theory provides a holistic approach to all sorts of social, and natural systems. It stresses the importance of considering not just the elements of the system, but their interrelationships, the relationships outside the boundaries and among sub-systems (e.g. internal processes, feedback, communication processes), in order to understand the overall functioning of each system. In this perspective, tipping points can be conceived as a peculiar trajectory of change through time.

It is important to stress that systems change in response to internal and/or external factors. Moreover, they display a dynamic existence, alternating periods of balance and change coherently with the general process of *adaptation*: “over time, systems may attempt to preserve their present status; but they may also need to change in response to transformations in their environment or alteration of a component within the system itself” (Cooper, 2012, p. 10). In such dynamic, tipping points can be defined as ‘non-gradient models of change’, i.e., an abrupt or dichotomous change in the status of the system.

These concepts have been recently absorbed into the dynamical system approaches in social psychology, which provides useful constructs to interpret and model critical junctures, loops, and transitions from one basin of attraction to another (Vallacher & Nowak, 1997; Wiese et al., 2010). Within this framework, system stability and change are considered as emergent properties guided by principles of self-organisation. In this sense, an organised system is not only stable but also resistant to change, thanks to its capability to attract the behaviour of existing and new elements into regular dynamics. Change depicted by tipping points should thus occur as a non-linear transition dynamic when mutual influences among the

elements are transformed and when the coherence and stability of the higher-order state are weakened (Wiese et al., 2010).

For example, dynamical system approaches in social psychology are starting to be used to interpret and model critical junctures, loops, and transitions from one basin of attraction to another (Wiese et al., 2010). An example is provided by research at the crossroad between political and social psychology, which is interested in locating psychosocial processes within historical and political trajectories. Interesting in this sense is the proposal to examine nations as dynamical systems, defined by three parameters:

1. State symbolologies, that is, the systems of symbolic meaning which are actively promoted by the state itself, including narratives, rituals and other symbolic strategies aimed at preserving and promoting the legitimacy of a given political and social structure
2. An identity space that is the ensemble of groups and social identities that co-exist, cooperate and clash within a society. Their own symbols may, and narratives may converge or be aimed to replace or become a viable alternative to the state symbolologies and technologies
3. Technology of the state, that is, the material facets of states, including the apparatus, the institutions and the technological means used by the state to maintain and reproduce itself (Leone and Sarrica, 2017; Liu et al. 2014)

2.3 *Socioecological Psychology*

Finally, putting individual and systemic processes in context, the emerging field of socioecological psychology seems particularly relevant to understanding complex phenomena such as decarbonisation. Socioecological psychology (Oishi, 2014) shares with environmental and community psychology a common interest in everyday environments, and with cultural psychology the assumption that environment and mind mutually constitute each other. However, recovering a historical and materialist tradition, socioecological psychology underlines more than the other approaches the importance of “objective, concrete, macro conditions (e.g., green space, sex ratio, and income inequality) as well as cultural contexts” (Oishi, 2014, p.583).

For example, socioecological psychology can be used to study how social norms and values, as well as economic and political systems, influence the adoption of renewable energy technologies and the development of policies that support energy transition. Additionally, socioecological psychology would require considering the role of material environmental factors on energy transition. For example, access to green spaces, such as parks and forests, can influence people’s attitudes and behaviours related to energy, or living in polluted spaces could activate denial mechanisms when behavioural responses are considered ineffective or non-viable.

3 Conclusion: An Area to Be Explored

Despite the centrality of the models of change in psychology, and the growing interest in the perception of tipping points, dynamical psychological model and socio-ecological approaches and, if we look in particular at psychological approaches to energy transition (Krupnik et al., 2022), and more specifically at those interested in decarbonisation processes, the use of the term tipping-point is not common.

In the literature we examined in a previous review, which was not strictly psychological but included studies in social sciences dealing with decarbonisation processes (Rizzoli et al., 2021), the concept is explicitly addressed only in Otto et al. (2020), who consider tipping points as the transition in the perception of the environment: from fuzzy noise into well distinct stimuli to which humans react. Tipping points are otherwise used as an interpretative key to draw overall conclusions (Schmitz, 2017), or are broadly assimilated to dynamic in decision making (Cuppen et al., 2015), to threshold (Strauch, 2020; Weng et al., 2018), to the key events, decisions and actions associated with speed and scale of transition (Wiseman, 2018), non-linear transformations (Messner, 2015).

Drawing on the psycho-social understanding of tipping points sketched in this chapter it thus emerges the lack of a proper understanding psychosocial processes underlying tipping points.

In this sense, a first direction would be to rediscover the theoretical and methodological foundations through which psychology has dealt with processes of qualitative transformation. For example, although insights from gestalt have been included in contemporary systemic models, bringing out the (also historical) foundations of studies on perception would allow the tipping points to be defined in more detail, operationalising them at both the individual and societal levels.

Furthermore, research should understand the psychological connotation of tipping points. This complexity is determined by the different perspectives that are adopted in the evaluation of change. Within the same individuals change and inconsistencies can be observed from the outside, but managed and denied from the subject him/herself. Construct such as, polyphasia, cognitive dissonance, removal, stand for our capacity to deal with inconsistency without necessarily recognising them. Parallel, at the community level, visions external to the communities involved in the change, or internal to them, each carrying different interests, chase one another.

The classic distinction between emic and etic perspectives can help us in this regard. Following an etic perspective, the identification of “positive” or “negative” tipping points would depend on the dimensions decided from the outside, as a transformation in knowledge, in the group dynamics, in the materiality or in the enacted behaviours. Taking a pro-environmental perspective, for example, as the one that we share, the increase in significant as well as of relevant behaviours would be evidence of positive tipping points, since they would signal an increase in mitigation behaviours and in environmental awareness respectively. In the second case, from an emic perspective, the connotation of tipping points can only be identified “from the

inside”. Closely related to social representations and cultural models, an emic approach would focus on changes in interpretations, narratives, representations, and practices that define the relationship linking self-other-reality. An emic approach would rather identify a positive tipping point as a transformation in consciousness (at the individual or social levels) or in self-perception, even without an evidence of actual behaviours.

Finally, and perhaps this is the most innovative line, it will be crucial to link psychological processes and material components in the study of systemic transformations. Indeed, the proposal for a socio-ecological psychology, as well as the systemic approaches briefly summarised here, aim to address the difficult relationship between political, historical, ecological dimensions and psychological and cultural dimensions. This is an even more fundamental challenge, at a time when the radical changes brought about by the climate crisis are becoming evident. How, for example, will communities that have been connected to Alpine glaciers for centuries cope with their disappearance? how will the transformation of marine species affect the psychological well being of fishing communities?

In the cases reported in the second part of the book, environmental transformations intersect with other material aspects to which psychology has often given too little attention: changes in policies, economic transformations, power imbalances. Although from different perspectives, the relationship between qualitative changes in these material spheres and in the symbolic spheres connected to them appears in all chapters. Memory, identity, agency, justice, are just some of the aspects that are radically changing in the CCIR regions involved in decarbonisation processes.

Understanding how to leverage these mechanisms to foster a just transition, is a frontier and a challenge, which psychology cannot escape and to which, indeed, it can provide deep-rooted models and innovative proposals.

The field is all to be explored.

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