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Commentary

From academic to political rigour: Insights from the ‘Tarot’ of transgressive research

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ABSTRACT

The role of science and knowledge production is at a crossroads, as societal transformation calls for challenging dominant forms of knowledge production that have contributed to marginalizing other ways of knowing. This presents a challenge to mainstream science and invites a deeper reflection on our roles as scientists and exploration of alternative engaged, post-normal and activist approaches to research. This paper examines the diverse ways researchers are meeting this challenge. Employing the device of the Tarot deck we describe seven “characters” to illustrate the variety of roles and approaches that trans-disciplinary, transformative, transgressive and activist researchers are engaging in. These characters are used to introduce and develop the concept of political rigour as a means of expanded academic rigour in new emancipatory scientific paradigms. We demonstrate how these Tarot characters can be used as an activity for collective and personal reflexivity and propose ten principles that frequently emerge in a ‘political’ peer review process. We argue that the insights emerging from these strands of radical, critical, engaged and applied forms of scholarship, can significantly improve the understanding of what a “transformative knowledge paradigm” may look like in practice and how it can be mobilized for social change and environmental justice.

1. Introduction: the point is to change it

In the context of climate change, massive ecological destruction, and widespread social injustice, the world currently faces immense challenges (Future Earth, 2014). While terms like the ‘Anthropocene’ place responsibility for this socio-ecological disaster on humanity as a whole (Malm and Hornborg, 2014), critical activists and academics alike increasingly call for us to turn attention to the structures and systems at the root of this crisis, recognizing that true transformation will depend on identifying and resisting the entrenched power interests that dominate our personal and professional landscapes (Temper et al., 2018) (Fig. 1).

Within this transformation, the role of science and knowledge production itself is at a crossroads, as societal transformation calls for challenging dominant forms of knowledge production and the established protocols and discourses that have contributed to marginalizing other ways of knowing (Klein, 2015). The critique and diagnosis of the current crisis in science (Saltelli and Funtowicz, 2017) has led to calls

for trans-disciplinarity, conceptions of post-normal science (Funtowicz and Ravetz, 1994) to deal with wicked problems that cannot be solved by purely scientific-rational approaches (Rittel and Webber, 1973), the rise of activist-led sciences such as degrowth (Weiss and Cattaneo, 2017) and environmental justice (Rodríguez-Labajos et al., 2019; Conde, 2014), and a discourse on the need for “transgression” of academic protocols.¹

Trans-disciplinary research, which integrates knowledge from various scientific and societal bodies of knowledge and includes participation of actors from outside of academia to create legitimacy and ownership, is increasingly seen as necessary for addressing and responding to sustainability challenges, and also for integrating questions of socio-political justice in research (Moser et al., 2013; Lotz-Sisitka et al., 2015), and as such contributing towards a new scientific paradigm based on very different principles from those dominant today.

Other scholars are putting forward the notion of transgressive learning and science, which refers to boundary crossing and challenging oppressive normative structures, and is defined by Lotz-Sisitka et al. (2016: 51) as “critical thinking and collective agency and praxis that directly and explicitly challenges those aspects of society that have be-

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come normalized, but which require challenging for substantive sustainability transformations to emerge (e.g. colonial practice or epistemology, gender and race relations, social exclusion, environmental injustice) (Hooks, 1996; Dei, 2012)". It focuses specifically on structures of privilege, hegemonies of power, and innovative strategies to arrest systemic dysfunction or systemic violence, and it foregrounds epistemic, social and environmental justice (Hooks, 1996; Dei, 2012; Lotz-Sisitka et al., 2015).² Finally, transformative research is a concept that delineates a new role for science, which goes beyond observing and analyzing societal transformations to act as a catalyst for social change (Schneidewind et al., 2016). While the primary goal of transdisciplinary science is to produce new knowledge based on a scientific or societal question, transformative research and education takes a key role in establishing creative laboratories and room for experiments in a broader societal context. According to Pennington et al., 2013, transdisciplinary science and the engagement with stakeholders it entails can provide opportunities for the "disorienting dilemma" that can lead to transformative learning through the restructuring and integration of concepts, data, and methods.

The call for transgressive and transformative science while novel, extends and echoes a long tradition of scientists and scholars openly and unapologetically committed to radical social change (Marx, 1980) that has been variously denominated as militant, emancipatory and solidarity-based research, and which we refer to as engaged or activist-scholarship. While approaches like Post-Normal Science (PNS), often embraced by ecological economists (e Silva and Teixeira, 2011), hold potential for navigating activist research environments in which facts and values are so closely intertwined, a key problem with PNS is that it does not offer a clear theory of science and methodology remains underdeveloped (Spash, 2012). Further, it as of yet lacks meaningful engagement with other schools of radical scholarship. Indeed, until the present there has been minimal engagement and synthesis between transdisciplinary sciences such as ecological economics (Costanza, 1991; Shi, 2004) and the diverse modes of radical and transgressive scholarship we explore here.

In this article, we argue that the discourse and practice on the needed transformation of science must bring these diverse activist and transgressive approaches into dialogue. This includes learning from activist, queer, feminist, indigenous and non-Western approaches and methodologies, embodied ways of knowing, and further openness to novel approaches and experimentation. We do not propose acceptance of the uncritical plurality argued by Dow (2007) and Spash (2012) as counterproductive, but the opposite. We argue that a deeper engagement with diverse approaches, and the identification of shared principles, perspectives, and methodological approaches can bring greater theoretical and methodological clarity and coherence to activist-scholarship.

This paper is our offering to researchers interested in conducting research for transformation under this evolving paradigm, where resources and information can be difficult to find. While many agree on the need to enhance and complement the sole focus on traditional 'scientific' rigour within a positivistic framework (Tacconi, 1998), alternative quality standards for transformations research remain only partially developed. We therefore gear this paper towards activist-scholars and other socially engaged researchers navigating this new post-normal

world. For the purposes of this article, we consider the activist scholar as one who learns about the world through transforming it (and vice versa), inevitably transforming herself in the process. Our aim is therefore to explore the concept of transformative and transgressive activist scholarship, and to provide a roadmap of sorts for the intrepid researcher that is aiming to do both politically rigorous and scientifically robust research.

After positioning ourselves and our motivations, we propose the concept of 'political rigour' as a necessary component of transformations research and explain the methodology of the collaborative reflexive process of the Tarot. We then provide a 'guide' to some of the critical, theoretically-informed activist-scholar approaches being adopted by environmental justice and sustainability researchers. To do this, we use both the metaphor and the practical device of the Tarot deck to draw from and point to diverse literatures largely absent until the present in mainstream sustainable environmental sciences research. These include feminist scholarship and ethics of care, indigenous and decolonizing methodologies, critical realism, queer theory, embodied research, environmental education, and anti-oppressive research.

We conclude by arguing that these tangible examples of how activist-scholars are engaging with the complex spaces they live and work in can significantly improve the understanding of what a transgressive knowledge paradigm centered on the concept of political rigour may look like in practice and how it can be mobilized for social change towards environmentally just outcomes. Deeper engagement and analysis of shared aspects of praxis amongst these diverse approaches also brings greater clarity regarding methodological coherence for transdisciplinary sciences like ecological economics. We define and present political rigour as a tool for bringing reflexivity and consciousness to every step of the research process we are engaged in and call for the elaboration of other tools, disruptive practices/pedagogies, games and exercises that can help guide a reflective process of political rigour.

1.1. Positioning ourselves

We are three scholar activists who have been engaging with and mixing different approaches to environmental science, transgressive social science, education, art, activism, teaching, and transformations research. We come from inter/transdisciplinary backgrounds: ranging from ecological economics, environmental science, biology, educational sociology/art and human geography. Understanding social and political dimensions of sustainability, we have worked carefully with our peers to develop a device for carefully engaging with the reflexive rigour needed to respond to the social and political dimensions of the environmental crisis.

After facilitating a reflexive collaborative process with a wide spectrum of academic activists in Beirut Lebanon, in 2017, we went on to refine and develop this process in South Africa, Mexico, Canada, Sweden, Spain, Colombia and the UK, with other academic activists and sustainability practitioners. We have developed the Tarot as a metaphor and device for making the socio-political and ethical engagement with the social challenge of sustainability more accessible, reflexive and attentive.

This paper serves as a theoretical base for this process and arises from our experiences of having to transgress typical roles and responsibilities of researchers in the academy, where the concerns, needs, tensions and issues we are working with, as well as our personal contexts, demand counter-hegemonic approaches. At the same time, some of our peers (often bound by bureaucratic, Cartesian and positivist orthodoxies) sometimes struggle to support us as early career researchers working on these issues. We are also inspired by the errors we have made, the struggle of dealing with the imperfectness of working with 'wicked problems' (a term Rittel and Webber (1973) used to describe the complexity of social and environmental problems which could not be

¹ .

² Inherent in a definition for transgression, is the plurality in which transgression can be defined, as 'transgressive research' aims to challenge that which has been normalized, and so sticking to a single overarching definition for transgression may not be helpful in creating a generative and creative environment for transgression in varied contexts. In light of this Lotz-Sisitka et al. (2016) provide descriptors as opposed to solid or static definitions of transgressive learning such as critical, empathetic, connective, dialogical, radical, and explicitly normative (Freire, 2000, Hooks, 1996; Dei, 2010; Gablik, 1992).



Fig. 1. The Tarot deck of transgressive research.

solved by purely scientific-rational approaches.) that are in a constant state of flux; as well as what is emerging from our research community: we see our peers grappling with similar struggles and having to navigate these issues in a similar way, and so this paper has emerged as a way to acknowledge these struggles and open up communal reflexivity.

2. Literature review: juggling academic and political rigour

It is increasingly acknowledged that trans-disciplinary research (TD) necessitates new forms of radical reflexivity (Cunliffe, 2003). This includes the explicit articulation of values, assumptions and normative orientations; and renewed attention to asymmetries in power amongst participants engaging in new approaches, methodologies, and processes of co-production. Such reflexivity signals the need to move beyond principles of academic rigour such as internal validity, external validity, reliability and objectivity integral to a positivist framework,³ to include new approaches of assessment centered on accountability to the communities we work with and for, as well as accountability to ourselves as individuals and to informed by our values, knowledges and belief systems. Rather than a dichotomy, these new approaches can There have been proposals to critically evaluate transformative research, its methods, processes, impacts and ways of engaging with other knowledge holders, that we may draw from in this endeavor. Merton's "ethos of science" (1973) proposed the acronym CUDOS, standing for values such as Communalism (a scientist ought to make knowledge accessible to other scientists, as knowledge is common ownership), Universalism (scientists ought to assess knowledge claims based on pre-established objective criteria), Disinterestedness (a scientist may not hold conflicts of interest that can corrupt the research results) and Organized Scepticism (scientists ought to conduct organized quality control of knowledge claims) (Merton, 1973).

Nowotny et al. (2001) argued that when lay perspective knowledge and alternative knowledge are recognized, a shift occurs from solely

³ While there have been far greater and more rigorous critiques of Positivist and Hermeneutic framings than we can make here (Bhaskar, 1993, 2016), we attempt rather to focus specifically on how environmental change research and its struggle against a positivist assumption that technological invention can solve the world's ecological and social problems (especially when we are observing scientific innovation gives birth to a myriad of new 'wicked' problems (Rittel and Webber, 1973)).

"reliable scientific knowledge" to inclusion of "socially robust knowledge" that transgresses the expert/lay dichotomy while fostering new partnerships between the academy and society. Within this trans-disciplinary paradigm, and "socially distributed" knowledge production, tacit knowledge (i.e. unwritten, unspoken, and hidden knowledge held in practice by very normal human beings, can include emotional knowledge, emotions, experiences, insights, intuition, observations and internalized information) is as valid/relevant as codified knowledge (Gibbons, 1994:3); quality control is exercised by a community of practitioners rather than by the logic of narrow disciplinary academic criteria (Gibbons, 1994:33) and success is defined in terms of societal usefulness and problem-solving ability.

Van der Hel (2016) identified questions of accountability, impact and humility as the key logics within knowledge co-production. Other frameworks for critical evaluation of TD research include Mitchell et al.'s (2015) outcome spaces framework for purposive transdisciplinary research, Pereira and Saltelli's (2017) call for reflexivity, quality assurance and an ethos of care in post-normal science, and König et al.'s (2017) ethos of post-normal science. Writing on the crisis of science, Saltelli and Funtowicz (2017), drawing from Mellanby et al. (1971) point out that the replacement of the 'Gemeinschaft', the community of scientists whose personal acquaintance kept them committed to a high moral standard, by a 'Gesellschaft', where the worth of each member is evaluated by 'objective' metrics, has led to degeneration and corruption of the practice of science. They offer several correctives with how to cope with the democratization of expertise, and the need for new forms peer review and quality control as a partial resolution to the impasse.

However, while these scholars and others propose a variety of tools for doing and critically evaluating transdisciplinary and activist research in a post-normal context, there has been a lack of engagement to date between this literature and an array of long-standing and emergent activist-scholar approaches that could have important relevance for mainstream science's need to understand and address sustainability as a social challenge, not just an environmental one.

This includes a body of literature dedicated to the relationship between research and politics; ranging from the emancipatory praxis advocated by Freire (2000) and other participatory action researchers (Chambers, 2009; Fricker, 2007) to a rich body of work on the problematic of politically committed research (Gramsci, 1971) and on ques-

tions such as methodological implications and negotiation of power relations within the research process; how questions are formulated, which publics they serve (Potts and Brown, 2005), how participatory the approaches are (Lotz-Sisitka, 2009a, 2009b; McGarry, 2013), to more practical questions such as how to deal with risks of activism such as threats and silencing tactics (Flood et al., 2013), to how science can be mobilized and led by activists to serve their needs and contest pollution (Conde, 2014).

Literature on scholar-activism has also examined the challenge of the “dual loyalties” (Hale, 2006) that scholar-activists must juggle while trying to ensure both academic and “political rigour”.

Scientific rigour can be defined broadly as “the development of new knowledge and innovation using a methodology that ensures the reliability and relevance of results”.⁴ It differs amongst disciplines but may entail application of the scientific method, substantiating assertions, referring to sources and the broader literature, distinguishing between facts and interpretations and clearly presenting how you arrived at your results. Rigour demands robustness, meticulousness and carefulness theoretically, methodology and empirically. It guards against recklessness, cherry picking, lack of attention and groundless conclusions. It also demands openness to fallibility – “the destruction of beautiful ideas by facts.”

While laudable, it is important for scientific rigour not to become rigidity. Along with rigour, vigour is also key. And scientific rigour alone is often not enough. In his “Manifesto of Trans-disciplinarity”, Nicolescu (2002) posits that the three characteristics of a transdisciplinary perspective are rigour, opening and tolerance. According to him, the rigour of transdisciplinarity goes even deeper than scientific rigour, “to the extent that it takes into account not only things but also beings and their relations to other beings and things. Taking account of all the givens present in a particular situation is a characteristic of this rigour. It is only in this way that rigour is truly a safe-guard against all possible turns. Opening brings an acceptance of the unknown, the unexpected and the unpredictable” (p. 120).

Along the same lines, Borrás (2016:33), argues that political rigour.

“means being politically informed and thorough, sensitive and nuanced, and timely and relevant. It should be the opposite of a post-mortem way of thinking and doing things. It means taking a position on political processes that are being researched which in turn runs the risk of compromising the rigor of the academic dimension of the research.”

In this paper, we extend the concept of political rigour, as one that can be potentially fruitful to guide intrepid transformative activist-scholars through the tough choices they must make about where, with whom and how they engage in their quests to transform the world. Political rigour uses as its departure point the acknowledgement of the inherently political and culturally and historically situated nature of knowledge production (Haraway, 2003) and the observation that all research, science and forms of knowledge production are inherently political enterprises, impacted by unequal power relations. We do not in this paper shun positivistic science, rather we draw inspiration from the creative expansion of science through critiques of normal science, and critical social theories and methodologies in post-normal social science (Dean et al., 2006).

We take inspiration from Bhaskar's (2016) critical realist theory of ontology, that recognizes that our perceptions of reality are inherently ontological and influenced by multiple renderings or perceptions of truth. Political rigour could therefore be seen as a critical realist mechanism that is reflexive and critical of our stance of ‘truth’ and opens up

the possibility for multiple truths (of which Bhaskar identifies four distinct forms). Here multiple pathways to truth can be critically and rigorously observed through understanding their ontology, epistemology and rationality- and the context that these knowledge(s) emerge and respond to. Political rigour therefore undermines our dogmatic positivistic assumption that there is one overarching truth attained through pure ‘scientific’ objectivity (Bhaskar, 1993; Rabinow, 1996; Lotz-Sisitka, 2009b).

While academic rigour is ensured through the scientific method and verified through a process of peer review, there is no pre-conceived system of ensuring political rigour nor for navigating the potential trade-offs and complementarities between academic and political rigour; as the forms of knowledge needed by diverse constituencies will not necessarily align (Borrás, 2016). We thus argue that further development of a reflective and iterative framework for assessing “political rigour” can be put to use to address the tensions and synergies and challenges of activist and transformations research. This includes mechanisms more able to identify how future research may generate findings that can inform politics and practice.

Beyond this, the development of a political rigour framework can address ways to bridge discourses between the interests and needs of social movements and academia while building trust (Edelman, 2009); can expose potential contradictions, ineffectiveness and hypocrisies while supporting a political struggle (Vinthagen, 2015); and can provide a critical perspective on participation and its constraints, and on the limits and challenges of developing an emancipatory research program within neoliberal academic institutions and disciplines that continue to be structured by power interests and hierarchies (Temper and Del Bene, 2016; Chatterton et al., 2010). Finally, it can address how overburdened academics can find space for joy in reflexivity, supporting of struggles and collective action amidst precarity and the pressures of the academic publish or perish rat-race.

In the next section, we offer tangible examples of what political rigour looks like in practice through an exploration of the diverse roles that researchers are adopting under the new paradigm, and how they are navigating these uncharted waters. In the discussion, we open a dialogue through a reflection on these roles and how they can inform the development of a politically rigorous praxis for transformations research.

3. Method: the Tarot deck of transgressive research

In this paper we propose the Tarot as a device for exploring diverse approaches to research. The Tarot is a set of playing cards, usually consisting of a pack of 78 figures or symbols which is traditionally used as a way to awaken the intuition of the reader and the “querent” as a means to improve their understanding of a situation or provide an answer to a question. The cards, divided into the minor and major arcana, represent a variety of different situations, archetypal concepts, and/or personality traits, such as “the Lovers”, “the Hermit”, “Death” and “the Fool”, that can be read as a language, composed of symbolic representations like notes in a musical scale, each one having a different effect on the reader of the cards (Giles, 1994).

The Tarot cards can thus be seen as keys which aim to unlock intuition by challenging the reader to confront symbols they would not normally consider. In this way the Tarot can lead to new insights, out-of-the-box thinking and a new perspective. Each card or character will prompt in the reader a different interpretation and association informed by her life experiences, stories and personal narrative.

Inspired by the use of the Tarot as a narrative device, a descriptive tool, and a way for the researcher to connect with their intuition, we suggest that the Tarot and its characters can be used by researchers struggling, as do we, with defining their role as scholars and activists in a transforming world in several ways. This includes surfacing and ex-

⁴ See for example: <https://www.kth.se/social/group/examensarbete-vid-cs/page/requirements-of-scientific-rigour/>.

ploring their own positionality and roles as researchers, contributing to a definition of the diverse considerations inherent in politically rigorous research and helping to define the values that inform and guide their own research.

To this end, we created an exercise employing arts-based methods that invites researchers to define and explore their own roles and responsibilities and identities as scholars. During workshops held in Beirut, Barcelona, South Africa and Lund, Sweden,⁵ we invited researchers to reflect on the following key questions, and to create their own “Tarot card”, using a process of collage that involves selecting from symbolic images provided or ones they had gathered that speak to the research identities, tensions, questions and concerns in their work.

- What character or role do you identify with in your research/activism up to this point?
- What images surface for you when you think of your work?
- What challenges and tensions come into play when you adopt this role?

The exercise led to the creation of a space for reflexive exploration into each researcher/activist's unique and plural expressions of their roles and actions, both ideal and actual, that were generatively surfaced in this simple process (Fig. 2).

In this paper we highlight seven “characters” that we have seen both within our own research communities and in critical literature, each of which embodies diverse aspects of academic and political rigour in their own way. There are obviously many more and it should be noted that these characters should be considered as emergent, flexible, and often contextually specific. We do not suggest researchers limit themselves to identifying with one “card” or the other, instead we propose that researchers use the characters presented to observe and reflect on the variety and diversity of approaches and roles that can exist in different moments throughout the research process (Fig. 3).

4. Results: our Tarot deck

4.1. The post-normal scientist

Like the fool in the first card of the Tarot, the post-normal scientist is one who is venturing into the unknown, or what Sardar (2010) calls the post-normal times characterized by complexity, chaos and contradictions. She becomes what Funtowicz and Ravetz (2003) call “The Post Normal Researcher” who is aware that the paradigm of normal science and its problem-solving approach is obsolete. This character emerges out of critical realism literature (Bhaskar, 1993, 2009, 2010, 2016), and out of the post-normal science canon (Ravetz and Funtowicz (ibid); Dean et al., 2006; Sardar, 2010).

This researcher, navigating these conditions of transition, uncertainty, shifting power dynamics, high stakes yet urgent need for decisions, relies on tremendous creativity, imagination and acknowledgement of her own ignorance.

Regarding academic rigour, the post-normal scientist recognizes that problem definition, the choice of what gets measured and how, how values are defined and how decisions regarding this incommensurability are resolved, intrinsically entail a normative and political aspect, and require a sharp critical sensitivity to these norms.

⁵ As part of our involvement in two large transformative knowledge action networks towards sustainability (ACKNOWL-EJ and T-Learning) that brings together scholars and activists engaged in various forms of action and collaborative research, co-produced and expansive knowledge and agency building around complex nexus issues (climate, water, food, energy, extractivism, alternatives and other forms of resistance and ‘re-existence’).

This activist-scholar offers to a political rigour framework the need to transgress the boundaries of her own epistemic community and to reinvigorate debate amongst an extended peer community of “othered groupings” that bring their own diverse and situated perspectives and experiences (Salleh, 2015). In this sense, the reading of the Tarot card of the Post-Normal Scientist acts as a first step; an umbrella-card of sorts, and an invitation to engage more deeply with any number of other transgressive characters in order to guide us through our journeys, including those we dive into now, for which we highlight their background, their specific contributions to a conceptualization of political rigour, and challenges that might emerge within their approach (Fig. 4).

4.2. The indigenous scholar/ally

The indigenous scholar Tarot card teaches us how we can do research in culturally embedded ways and what we need to unlearn and let go of before we can do so. Indigenous communities have suffered inordinately from the “extractivist” nature of traditional research that has often imposed negative stereotypes, disempowered communities and “compiled useless knowledge” (Deloria Jr., 1973) that brought no tangible benefit back to the community.⁶

In response, Indigenous scholars have developed decolonizing methodologies that aim to place indigenous voices and epistemologies at the center of the research process (Smith, 1999; McKenzie et al., 2009). Importantly, as put by Tuck and Yang (2012), decolonization is *not* a metaphor: these methodologies fall under wider strategies of decolonization, which work to ‘unsettle’ very specific socio-historical contexts, including the indigenous scholar who prioritizes revitalizing knowledge that can be there for cultural resurgence. Makoonsz Geniusz (2009) does this through “*Biskaabiiyang*” which means “returning to ourselves” to pick up the things we were forced to leave behind [like] songs, dances, values or philosophies, and bring them into existence “in the future” (Geniusz, 2009: 49). Through *Biskaabiiyang* methodology, the researcher personally evaluates how they have been impacted by colonization, rids themselves of the emotional and psychological baggage they carry from this process, and then returns to their “ancestral traditions”.

Simpson also introduces two related Nishnaabeg concepts that can inform politically rigorous research. These are Naakgonige and Naanaagede'enmowin. The first means “to carefully deliberate and decide when faced with any kind of change or decision”; while the second is “the art of thinking to come to a decision” (Simpson, 2011: 56–57).

Weber-Pillwax (2001: 31) describes indigenous methodologies as founded on principles of interconnectedness, the impact of motives and intentions, research centered on lived indigenous experience, theories grounded in indigenous experience, research as transformative, sacredness and responsibility of maintaining personal and community integrity, and language and culture as living processes. These methodologies are embodied practices designed primarily to guide researchers in their work in their own communities and personal process of decolonization.

Naakgonige and *Naanaagede'enmowin* ask the person to reflect on a problem to figure out what needs to be done. According to Simpson, this is a rigorous culturally embedded process that requires deliberation not just in an intellectual sense but using their emotional, physical and spiritual beings as well. Similarly, the researcher should also engage body, heart and mind to evaluate the wide-ranging and long-term potential impacts of their research practices, and how their research

⁶ .



Fig. 2. The arts-based Tarot exercise.



Fig. 3. The post-normal scientist.

may contribute to putting in place the transformation they would like to see in the world.

As Smith (1999) explains in *Decolonizing Methodologies*, traditional research on Indigenous peoples, or “research through imperial eyes”, marginalises the stories of the Other within a claim of universal



Fig. 4. The indigenous scholar.

truth. She exhorts Indigenous researchers and “other researchers committed to critique their own gaze and to rethink how their work can support alternative readings and bring forth silenced voices.” Her work provides guiding questions for shaping the research process in a politically rigorous way, prompting us to consider aspects like accountabil-

ity, support systems, worthiness and relevance of the study, and possible positive and negative outcomes (Smith, 1999: 173).

However, according to Simpson (2011), *Biskaabiyang* entails not just an evisceration of colonial thinking before a new research project begins; it is a constant continual evaluation of colonialism within both individuals and communities. It also encompasses a visioning process where we create new and just realities and in which our way of being can flourish. *Biskaabiyang* echoes the concept of decolonization, however Simpson explains how for her it represents a way of grounding resurgence and decolonization within a “new emergence” (Fig. 5).

4.3. The anti-oppressive researcher

The anti-oppressive researcher responds to calls from environmental justice groups and critical academics to investigate and resist oppressive social systems at the root of the current ecological crisis (Plumwood, 2002; Di Chiro, 2008; Walia, 2014), including their manifestations within academia and dominant processes of knowledge production (Strega and Brown, 2005). This Tarot card can help guide scholar-activists through positionality and power relations within research processes, prompting them to center interpersonal relationships, reflexivity, the question of whose interests are served by research outputs and design and whose are not, and the identification of the research process itself as a site for resistance and transgression.

Anti-oppression as a theoretical framework stems from anti-oppression discourse and practice within the field of critical social work, which highlights difference and diversity of human experience as an attempt to avoid reproducing harmful structures of power, exclusion and marginalization (Brown, 2012). Clifford (1995), inspired by Black femi-

nist thinking, argues that an ‘anti-oppressive’ practice would be one that focuses on manifestations of racism, classism, sexism, and other forms of discrimination in interpersonal or organizational interactions where concentrations of rewards and services go towards powerful groups, while considering social divisions like race, gender, class, disability, age, and sexual orientation as connected to broader social structures.

The anti-oppressive researcher pays particular attention to the shaping of the research agenda, examining who is and who is not involved in picking the topic, whose interests are served and whose are not, and what is and what is not explored. By constantly asking questions, the researcher seeks to bring to light the assumptions about people, power, knowledge and relationships that they hold, thereby identifying how power relations shape the research process. This attentiveness allows a reconceptualization of research as an emergent process, not a linear, predetermined one. An anti-oppressive researcher sees themselves as both oppressor and oppressed, depending on the context, and considers that in order to challenge power relations in knowledge production, one must also challenge the dominance of current paradigms of research (Potts and Brown, 2005).

Drawing from Indigenous theory, feminism, critical race theory, Marxism, poststructuralism, and postcolonial thought, anti-oppressive research (AOR) can act as one strategy to challenge toxic social relations via knowledge production processes (Potts and Brown, 2005). The framework demands methodologies that resist dominant interests and powers within and outside of academia, centering reflexivity and consent (Strega and Brown, 2005) and should avoid both essentialism and subjectivism (Brown, 2012). In this way, AOR acts as an intervention; a way for researchers to ask questions, seek answers, and develop new questions all while focusing on relationship-building (Potts and Brown, 2005).

One potential pitfall of the anti-oppressive researcher is the over-simplification or generalization of experiences of oppression and power based on pre-set identity categories, even when using an intersectional lens (as proposed by Crenshaw, 1991). They also risk becoming so focused on disrupting and opposing the status quo that they fail to critique new normalizations and power structures emerging within their opposition.

4.4. The co-conspirer

The co-conspirer is an activist that conducts research to enrich the justice movement that they are specifically immersed and implicated in. She seeks to amplify the knowledge held in marginal spaces that sits outside of the hegemonic meaning-making machine (Kulundu, 2016; Kulundu, 2018). She collaboratively struggles to understand the concerns, challenges and transgressive practices of those that she is bound with in solidarity in their quest for emancipation. She conspires with those in the fringes of society with the intention of building a counter-hegemonic expression and practice that emerges from their epistemic beliefs and ontological yearnings of those that she is in solidarity with, and she struggles with others to build on the emerging language and practice (Kulundu, 2016). This way of working believes that without a flourishing understanding of who we are, we lack then the epistemological roots to guide or trace our way forward (Fig. 6).

The co-conspirer works to help regenerate and reproduce the collectively imagined and desired emancipation of those she is working with. She takes careful and incremental ontological steps with the collective to build creative and revolutionary praxis. She sees imagination as a key tool in shifting dominant hegemonic discourse (Smith, 1999: 39) as she understands re-imagining processes as not just a re-thinking of how one sees the world; but expanding our way of being by opening ourselves up to alternatives and bringing these alternatives to life through our writing, our art making and our performance.



Fig. 5. The anti-oppressive researcher.



Fig. 6. The co-conspirer.

In particular, the co-conspirer raises concerns over the discarding of human embodiment of the environmental imaginary and she encourages an embodied ecological citizenship, that attends sufficiently to body, place, and politics, especially as these are understood as different modes of engagement with the world within history (Reid and Taylor, 2000: 440). Like the trickster, personified as the jackal in many African stories, she is able to move between worlds with ease, in this case the existing hardened socio-economic and political histories that we respond to daily, while maintaining a deeply connected and sensorial relationship with the wider natural ecology. She responds to the cultural and political “body-blindness” we see in technocratic environmental responses connected with the disparagement of local knowledge and personal forms of knowing and capacities not only in the policy system, but also in education and even in the larger environmental movement (McGarry, 2013). The co-conspirer challenges body-blind, non-dualistic understandings of the individual within a matrix and subject/object dualisms, and connects this to democratic freedom (Reid and Taylor, 2003).

She is sensitive and observant to surface native meanings from what we might think is routine and mundane and reveals the innate knowledge that colours it (Fricker, 2007). She understands that erotic knowledge (i.e. embodied, intuitive and instinctive ways of knowing) (Lorde, 2007) of this nature is a vital resource; it is cultural capital that holds power that grows as it is consistently surfaced and acknowledged as knowledge, and sees this knowledge as a ‘hermeneutical resource’ (Fricker, 2007: 155). The co-conspirer opens up what Homi Bhabha calls the generative ‘third spaces’ that go beyond dominant discourses and binaries in educational research, and draws from phenomenological and sensual renderings of the world (Merleau-Ponty, 1968; Cobb,

1977; Abram, 1988, 1996). This phenomenologically shaped third space generates new possibilities by questioning entrenched categorisations of knowledge systems and cultures and opens up new avenues with a counter hegemonic strategy (Breidlid, 2013: 626).

The co-conspirer is implicated in the movement/action and so needs to maintain a healthy connection to her own identity and autonomy. The co-conspirer also might find that she can get lost in the generative emergent processes of the group and should strike a balance between lifting out erotic knowledge systems (Lorde, 2007: 59) and personal agency with the need to transfer these knowledge(s) into collective actions and agency (Kulundu, 2018). The co-conspirer might be overwhelmed with emotional, traumatic or difficult forms of knowledge that might emerge from her transgressive practice and she must be able to find psycho-social support when necessary to hold and recognize these emotionally complex knowledge(s) (Fig. 7).

4.5. The Responsible Participant

The Responsible Participant strives to participate in and hold a transformative and connective social space, that is cognizant of parity, inclusion, reflexivity, empathy and intuitive imaginal thought (McGarry, 2013, 2014), and that disrupts hegemonic or ‘taken-for-granted’ social forms of engaging. The Responsible Participant - originally coined by Shelley Sacks (2011) - refers to the researcher as reflexive practitioner/intervener/facilitator in an emergent research process rather than the dominant force controlling the shape of the process.

The Responsible Participant aims to remain present, by being present with her own senses and sensibilities (see Scharmer, 2007 in working with the concept of ‘presencing’ as part of his “U-theory”). In this

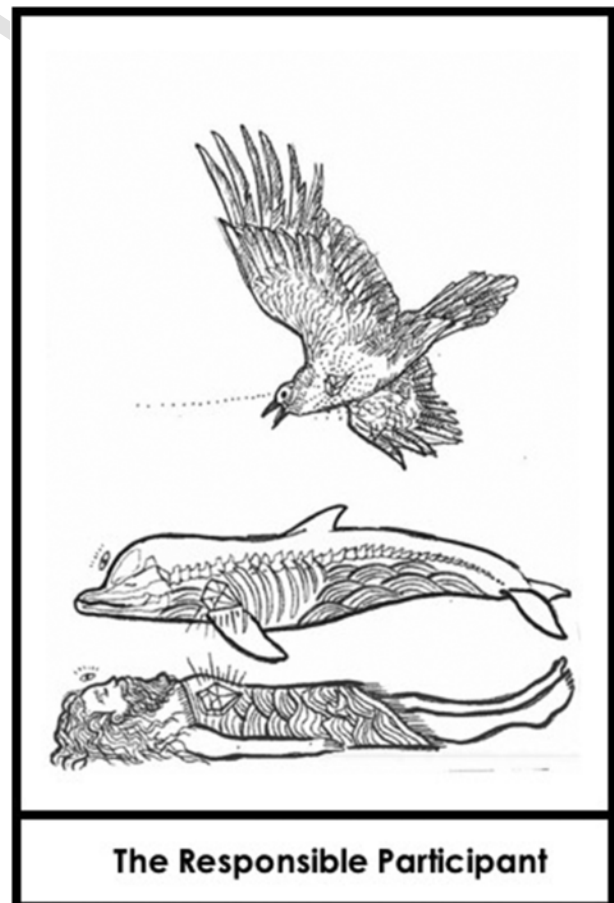


Fig. 7. The Responsible Participant.

way she becomes an apprentice to her own intuition, imagination and empathic capabilities, as well as an apprentice to the participants' ontologies that she is working with (McGarry, 2014). She ensures that the pressures of moral imperatives do not govern her praxis alone, but rather her personal ability to act in an intuitive, reflexive and caring way, which guide her participation beyond a basic commitment to do-no-harm (McGarry et al., 2017). As Social Development practitioners and authors of 'artists of the invisible', Kaplan and Davidoff (2014) quote Rudolf Steiner's (1995) insistence of an 'intentional wakefulness' that ensures they are vigilant in avoiding strengthening the very patterns and behaviours that they have set out to change.

A primary aim is to reduce the power of the researcher as facilitator and to avoid the facilitator's potential capacity to manipulate - or what Chambers (2009) calls *facipulation* (manipulated facilitation). This character calls for sensitivity to the tyranny of participation (Hickey and Mohan, 2004) by relying on generative and accessible facilitative forms, such as connective aesthetics (Gablik, 1992) and/or social sculpture methodology (Beuys, 1977; Sacks, 2011; McGarry, 2013). The Responsible Participant sees the aesthetic as the opposite of anesthetic (Benjamin, 2008; Buck-Morss, 1992; Sacks, 2011). The aesthetic is therefore an enlivening, sensorial and awakening force that can create spaces of extra-social authority that exist outside of a human being, and within a collectively agreed upon culture of engagement around a central connective image/space or a sculptural object.

Through a combination of internal and social reflexivity, the Responsible Participant is able to navigate their power and thus to hold the learning/transgressive space on the behalf of the whole, allowing the research to participate in a more equitable (less-dominant) form in the learning/exchange. McGarry (2013, 2014) highlights the potential for this approach in collaborative practice-based research for developing methodologies and pedagogies for embodied ecological citizenship (Reid and Taylor, 2000).

We have also seen the Responsible Participant as responsible for carefully disrupting normative absences through applying disruptive pedagogies that lift out the systemic causes for significant ills plaguing a group or a community. A simple example is removing the waste bin from a household which removes the possibility to have a place to throw away and therefore absents waste, which could lead to generative new possibilities of avoiding waste. In the same way the Responsible Participant is constantly collaboratively seeking out ways to absent the "absences" (Bhaskar, 2016) inherent in driving many of our daily social and environmental problems.

The Responsible Participant needs to avoid becoming over-reliant on exercises, procedures, games, models and frameworks that she uses to in her repertoire (Kaplan and Davidoff, 2014: 4). While these instruments are useful for engendering participative thinking and action, they should not be dogmatically applied to all manner of situations as techniques that must always resolve both our social and ecological dead-ends (Chaves et al., 2015), there are many subtle and nuanced paradoxes that come with being human (Kaplan and Davidoff, 2014: 4) and she should find a balance between the instruments/processes she uses with their intuitive, empathetic and imaginal reflexive capacities, that allow for innovation and emergence (Fig. 8).

4.6. The critical comrade/the dialectic activist scholar

The critical comrade is a character that allows us to think through and deal with both the synergies and potential tensions that may arise when juggling the dual roles of movement activist and professional academic/researcher. The critical comrade is committed to help generate knowledge which would be useful to social movements from below, however she acknowledges that while the collaborations between scholars and activists can be immensely fruitful, they can also be knotty and problematic and loyalties to both aims may conflict as there



Fig. 8. The critical comrade.

can exist significant differences in objectives, outputs and time frames. For example, activists often need to take decisions urgently and hope that academic research will be able to inform struggles in the moment; they can be unaccustomed to the slow pace of meticulous research. Other tensions entail the researcher's propensity to probe which may entail asking uncomfortable questions and lead to frictions, either because of a lack of delicacy; insufficient relationship building; or because of a hesitance to engage with difficult questions within the movement.

Every academic invested in social movement struggle continually needs to question how her research will be used to advance the cause or how it may be wielded politically - this is what we term the political impact and rigour of research. As Edelman (2009: 249) points out this leads to the need to avoid on the one hand an approach "which in its more extreme manifestations critics sometimes characterise as 'self-censorship', 'uncritical adulation' or even 'cheerleading'" and on the other to make sure that the research does not unwittingly strengthen the analytical capabilities of repressive forces, state surveillance, elite interests, or other hostile opponents, providing fuel against the movement and leading to divisiveness. Perhaps the most challenging for the engaged researcher is to find the way to be critically constructive, and to offer analytical and theoretical insights that can enrich the movement. In this, the critical comrade must rely on his own judgement as well as on a form of peer review that takes place through a dialectical process of debate, joint analysis, strategizing and discussion within movement spaces.

As Bond (2015) writes, "To fail to offer critical perspectives on movements against power is as serious an intellectual flaw as suffered by so many of our colleagues who write uncritically about the status

quo, succumbing to flatteries gained by serving power". Bond elaborates 10 sins that sympathetic academics must avoid when working alongside social movement agents, these include hijacking, in which a researcher takes ownership of a movement and its interpretation; **substitutionism**: whereby the researcher replaces local understanding with his own vision; **Ventriloquism**: re-phrasing of movement texts in his own (academic) words; **careerism through parasitism**: technicism, hucksterism, divisiveness, and betrayal. Within this the cardinal sin is perhaps "**Failure of analytical nerve**: inability (often due to fear) to draw out the fully liberatory potentials of the movement and its struggles or offer comradely critique of those movements." In this line, Edelman (2009) points out that one of the most productive contributions of researchers can be to identify exclusions and imbalances or organizational patterns through candid discussions with potential members who feel alienated, uninvolved or disaffected. Such insights that may be difficult to identify from within.

4.7. The Queer Enquirer

The Queer Enquirer sees opportunity for resistance in every step of the research process, using their position at the margins to creatively challenge hegemonic norms present in research institutions (Fig. 9).

Queer theorist herising (2005) proposes the possibility of ex-centric research and queer flexibility as one way to respond to calls to challenge current dominant research paradigms. An ex-centric researcher uses their research process to disrupt the academy's exclusion of marginalized voices by centering subjugated knowledges and advocating for their epistemic value, while queer flexibility implies an on-going opposition to the status quo by challenging the idea of identity as sta-

tic, and provides for transgressive methodologies that can be used as tools to disrupt hegemonic, normalized, and naturalized structures within academia. Through a lens of ex-centricity and queer flexibility, methodology becomes a radical strategy of resistance while adding transformative possibilities into a researcher's toolbox (Ibid.)

Queer Enquirers reject binaries and recognize the value of experiential knowledge. They build and imagine alternative worlds out of necessity and center the concept of consent as active and enthusiastic. Just as there are many more ways to love and express ourselves than the options presented to us as children, Queer Enquirers know there are limitless alternatives to normative scientific research. While underlying values, ethics and standards exist, there is no one 'right' way to be a researcher. They notice similarities between the punishment, exclusion, and severe pressure to conform to normative gender and sexuality (Elia, 2003) and the risks faced by scholar-activists (Flood et al., 2013) who fall outside of the 'charmed circle' (Elia, 2003) of 'acceptable' academic behaviour.

These researchers "advocate for humane, equitable change and conceive of ways research, texts, and bodies can serve as sites of ideological and discursive 'trouble'" (Burlington & Butler, 1999; Munoz 1999; Solis, 2007 in Adams and Jones, 2011, p. 110). However, they must avoid the traps of whiteness, elitism, and coloniality associated with some discourses around Queerness (Adams and Jones, 2011; Haritaworn, 2008; Elia, 2003), and should constantly seek to avoid (re)creating hierarchies within heterogeneous marginalized groups.

Queer Enquirers see knowledge production as a performance, with the potential to both perform the world we live in as well as the world we *might* live in (Gibson-Graham, 2008). Through embracing the transgressive potential of the latter, Queer Enquirers engage in imaginative processes of activism (Hwang, 2013) that seek to open new possibilities and support the building of alternatives (Gibson-Graham, 2008) (Fig. 10).

4.8. The slow and care-full scholar

The slow and care-full scholar seeks to create spaces for care and caring relationships amidst the demands of the neoliberal university that tends to devalue such relations and practices (Mountz et al., 2015). She resists these demands by prioritizing well-being, including one's own, in a space that would see the researcher primarily as a source of labour, and those she engages with in research processes as subjects to extract from.

This scholar rejects the dehumanization of herself and others, embodying an ethics of care that directs attention towards the most vulnerable amongst us. This can include our own students, anonymous scholars seeking critically constructive revisions, or adjuncts and teacher's assistants who are struggling with precarity. It may also include ourselves, and the challenge becomes how to engage in these relations of care while also practicing "self-care", being cognizant that "care work is work. It is not self-indulgent; it is radical, necessary and risky, imposing a burden on those who undertake it." (Ahmed, 2014). Or to be even more provocative in Ahmed's words (2014) echoing of Audre Lorde (2007), "self-care is also warfare" for those whose self-preservation acts as a form of resistance against a neoliberal system that threatens their very existence.

The slow and care-full scholar advocates for slowness not just as a form of resistance but also as a way to improve the quality and depth of scholarly material. Instead of rushed, superficial readings and interactions, she engages deeply and care-fully with texts and her research communities, taking time to think, consider, critique, and create (Mountz et al., 2015).

Care means accepting and embracing failure, it entails guarding against self-exploitation of care work and strategies to respond to the dictates of academic orthodoxy and success. It can mean a process and



Fig. 9. The Queer Enquirer.



Fig. 10. The slow and care-full scholar.

labour of creating new metrics and fostering a culture of appreciation for collective authorship, mentorship, collaboration, community building, and activist work in the germination and sharing of ideas and for convivial resistance to the current models of knowledge production. As Mountz et al. (2015) explain, “Care-full scholarship is also about engaging different publics ... refining or even rejecting earlier ideas, engaging in activism and advocacy, and generally amplifying the potential impact of our scholarship rather than moving on to the next product that ‘counts’ to administrators.”

The heroine who rejects the conformity and the metrics of the neoliberal university and focuses instead on relations of solidarity and a revalorization of marginalized caring activities inevitably faces a struggle to thrive and flourish within the university (Kronlid, 2009). In response she actively continues to remake the university, to at least name and acknowledge the power hierarchies she may be unable to confront (Temper and Del Bene, 2016), and to avoid academic ‘counting culture’ that breeds institutional shaming and self-audit, instead counting friendships, collaborations, and thank yous (Mountz et al., 2015).

The slow and care-full scholar might become so focused on care, however, that they become averse to the challenges, frustrations, and risk-taking often necessary to move through complex research processes.

5. Discussion: political rigour

Perhaps one or several of the archetypes included in this paper rang true to you, or, perhaps you would identify with a very different approach and would want to add your own character to the growing Tarot deck of transgressive research. These characters are intended to

prompt an ongoing conversation, inviting us to consider how we see our scientific practice, our engagement with other agents within the process of research, how values are reflected in the work we do, and how we sense that research leads to social and political change and transformation.

The Tarot exercise is just one example of a tangible strategy to open up space for individual and collective, collaborative reflexivity in our research communities. This exercise is a way to explore our own positionality and can be used as one piece in a more comprehensive effort to be more intentional in our research and activism practices. It also aims to awaken ourselves to the other senses that come into play in our research practices, including our bodies, our emotions, and our intuitions.

In this way the Tarot serves as a device and an entry point for exploring the “political rigour” of our knowledge practices. By drawing out key aspects of diverse transgressive research approaches, some of which we include in this paper, we can begin to give shape to this concept and how it can be applied.

Similarly to how scientific rigour can be defined as the application of the scientific method to ensure robust experimental design, methodology, analysis and reporting of results, we define political rigour as the application of methods of reflexivity in knowledge creation through which power relations and explicit values and aims of societal transformation are identified, reflected on, socialized and evaluated amongst an extended peer community, and reflected in the research design, methodology and research outputs.

If the methodology of the scientific method ensures the reliability and robustness of results for scientific rigour, for political rigour, a process of radical, intentional and inclusive reflexivity is what ensures accountability for the practical and political outcomes of the knowledge creation process. While scientific rigour uses peer review to as a means of verification, political rigour is verified through an iterative cycle of political peer review.

Like scientific rigour, political rigour also entails substantiating assertions, referring to sources and broader literature and discussions, distinguishing between facts and interpretations, but does so through a lens of power analysis, rejecting neutrality and false objectivity, and purposefully seeking out those voices often excluded in dominant science. In this way, political rigour uses scientific rigour strategically as a counter-hegemonic tool. In this way scientific and political rigour can be synergistic. While tensions surely exist, these are approached through being explicit and intentional with our biases and aims and clearly positioning ourselves. Political rigour makes space for the existence of multiple truths and uncertainty, but not uncritically. Above all, political rigour is fluid and heavily dependent on context.

Political rigour involves embedding active, strategic reflexivity into every step of the research process and entails social evaluation of the research amongst an extended peer community. It is process-oriented, not outcome oriented. It is a key consideration in a new knowledge praxis and includes consideration of epistemic justice (Fricker, 2007; Temper and Del Bene, 2016), that may be defined as the valorization and recognition of other forms of knowing and other life-worlds, including knowledges “From below, to the Left, with the Earth” (Escobar, 2016).

We aim to develop further tools such as the Tarot process for evaluating political rigour and for guiding reflexivity so as to assess the consequences of the research and how these fit into our values, objectives and broader transformative visions. We may ask of research intended for social transformation: “Research for what? With whom? How? What kind of change? How in practice will this production of knowledge transform power relationships?” Such a critical politically rigorous reflection would include consideration of the ontologies (what is truth?), epistemologies (what is the connection between the knower and what is or could be known), methodologies (how do we set out to

create and discover knowledge) and axiologies (what is essentially valuable and important) that inform the research process (Guba and Lincoln, 1994, Vargas et al., 2019). It includes a constant interplay and dialectic between action and reflection, often referred to as the praxis of research (Freire, 2000).

Questions to be examined include those on the transformative aims and desired political impacts emerging from the project, methodologies, explorations into the meaning and forms of participation, solidarity and reciprocity in the research, questions of relations with co-researchers, authorship and acknowledgment and enquiries into the sources of knowledge and attention to who is considered an expert, what forms of knowledge are valued and which are marginalized? What are our research publics and outputs - who are we speaking to and how in what forms? And how do we evaluate ourselves and seek evaluation from others?

Beneath all this is the question of the values and the criteria that inform the research. Here, based on our own experiences and those of others in our research communities, we propose some principles that frequently emerge in a 'political' peer review process. These are principles that have been reflected through the Tarot characters that we have just described which we suggest can act as guides in how some researchers apply these values in their own work. Thus the slow and careful scholar reminds us how to care and how to deal with the blurring of our personal and professional lives and the indigenous ally may teach us what reciprocity might look like even towards our non-human plant and animal research partners.

While these are values which have emerged here, we suggest each researcher to work together with their co-researchers and participants to jointly define the values and criteria that inform their own collective and individual processes.

Political peer review entails the joint definition of shared values as those above, the co-development of means to verify their application and integrity, and the outlining of an iterative call and response process for adjusting the research design, process and outcomes to ensure them.

1. **Accessibility** (research can be understood broadly and a means for social learning)
2. **Reflexivity** (critically examination of our own practices, presumptions and assumptions and the power relationships in our work).
3. **Relevance** (*co-defining Matter of Concern* with all involved. Research must be useful to emancipatory efforts of groups we work with)
4. **Transparency** (clarity of structure, processes and outcome)
5. **Care-full ness** (relations of care with oneself, loved ones, communities of scholar and participants)
6. **Respectfulness** (how are other forms of knowledge and worldviews valorized, recognized and integrated into the research process)
7. **Relationality** (research should be grounded and context dependent)
8. **Reciprocity** (co-design of research question, methods, analysis and outputs works as one method to help ensure reciprocity)
9. **Fallibility** (possibility to fail and learn from failure)
10. **Transformativity/Transgression** (how is the research transforming power relations and transgressing practice as usual to open up new emancipatory possibilities).

Adherence to such values can help inform scholar-activists in a collective process of creating transformative knowledge, that is sensitive

⁷ In this line, an interesting initiative is the citation practices challenge (<http://www.criticalethnicstudiesjournal.org/citation-practices/>), which reminds us to be intentional in our citation practices.

to the politics of co-production and how politics, interests, imperatives and knowledge of different actors and stakeholders are reflected in the final research. The new transformative knowledge paradigm demands such a newer deeper form of radical reflexivity that is in the making.

6. Conclusion

This paper has presented a variety of approaches that transgressive activist researchers are engaging in, directing the reader to references and literature on each and has forcefully argued for the need for political rigour informed by explicit values as a complement to academic and scientific rigour within a new paradigm of scientific quality for transgressive and transformative knowledge production and science. By identifying commonalities across diverse critical and emergent approaches to science, this paradigm helps us move towards more coherent methodological approaches in transdisciplinary sciences like ecological economics that have struggled with uncritical plurality and methodological confusion (Dow, 2007; Spash, 2012).

Our future research agenda in this line includes the elaboration of other tools, disruptive practices/pedagogies, games and exercises that can help guide a reflective process of political rigour. This process includes ongoing individual reflexivity, but also a collective exploration into the politics of knowledge and the thorny work we must do of complicating standard academic protocols and the transformation of the institutions we work in; and of how we produce and value knowledge production. In this vein, we must constantly ask ourselves and others, "how is this work transgressive?" (Lotz-Sisitka, 2016). How are we upending, challenging and questioning the assumptions, the dualisms, the anthropocentrism and objectification of traditional academic knowledge? Finally, how do we see our research as a process of becoming, and transformation rather than an uncovering of existing truth? We hope this paper contributes to opening up further space for discussion on how science needs to transform itself and serves as a vehicle for critical reflection for researchers redefining themselves and their work.

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