



Reprint of “Discourses of transdisciplinarity: Looking back to the future”[☆]



Julie Thompson Klein ^{*}

Department of English, Wayne State University, Detroit, MI 48202, USA

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ABSTRACT

The current ascendancy of transdisciplinarity (TD) is marked by an exponential growth of publications, a widening array of contexts, and increased interest across academic, public and private sectors. This investigation traces historical trends, rhetorical claims, and social formations that have shaped three major discourses of TD: transcendence, problem solving, and transgression. In doing so, it also takes account of developments that have emerged or gained traction since the early 21st century when a 2004 issue of *Futures* on the same topic was being written.

The epistemological problem at the heart of the discourse of transcendence is the idea of unity, traced in the West to ancient Greece. The emergence of transdisciplinarity was not a complete departure from this historical quest, but it signalled the need for new syntheses at a time of growing fragmentation of knowledge and culture. New synthetic frameworks emerged, including general systems, post/structuralism, feminist theory, and sustainability. New organizations also formed to advance conceptual frameworks aimed at transcending the narrowness of disciplinary worldviews and interdisciplinary combinations of approaches that did not supplant the status quo of academic structure and classification.

The discourse of problem solving is not new. It was fundamental to conceptions of interdisciplinarity in the first half of the 20th century. Heightened pressure to solve problems of society, though, fostered growing alignment of TD with solving complex problems as well as trans-sector participation of stakeholders in society and team-based science. The discourse of transgression was forged in critique of the existing system of knowledge and education. TD became aligned with imperatives of cultural critique, socio-political movements, and conceptions of post-normal science and wicked problems that break free of reductionist and mechanistic approaches. It also became a recognized premise in interdisciplinary fields, including cultural studies, women's and gender studies, urban studies, and environmental studies. And, calls for TD arrived at a moment of wider crisis in the privileging of dominant forms of knowledge, human rights accountability, and democratic participation.

Even with distinct patterns of definition, though, discourses are not air-tight categories. Transcendence was initially an epistemological project, but the claim of transcendence overlaps increasingly with problem solving. The imperatives of transgression also cut

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^{*} Correspondence to: 111 Linden Court, Ypsilanti, MI 48197, USA. Tel.: +1 734 482 2793.

E-mail addresses: ad5820@wayne.edu, julietklein@comcast.net

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across the discourses of transcendence and problem solving. Broadly speaking, though, emphasis is shifting from traditional epistemology to problem solving, from the pre-given to the emergent, and from universality to hybridity and contextuality.

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1. Introduction

In 2004, when a special issue of *Futures* took stock of prospects for transdisciplinarity (TD), the concept was not widely recognized. Even so, the editors and authors were optimistic about its future. Ten years might seem a short time to conduct another assessment of prospects. Despite widespread talk of “transformation” and “revolution,” the academic world rarely moves that fast or its outcomes take root in other sectors of society. However, the current ascendancy of transdisciplinarity is marked by an exponential growth in publications, a widening array of disciplinary and professional contexts, and increased interest in science-policy bodies, funding agencies, and public and private spheres. This contribution to a new special issue traces three major discourses of transdisciplinarity: transcendence, problem solving, and transgression. In doing so it also takes account of new examples that have emerged or gained traction or since the early 21st century when articles for the 2004 issue were being written.

The methodology of this investigation – discourse analysis – spans a range of approaches. Objects of study range from sentences and conversations to full arguments and social practices. Discourse analysis appears across a wide range of disciplines in social sciences and humanities and in interdisciplinary fields such as communication studies. It also ranges across a spectrum of quantitative and qualitative approaches. On the quantitative end of the spectrum, empirical studies often follow the structure of scientific articles: with an introduction followed by results, discussion, and conclusions. This study lies at the qualitative end of the spectrum. It is a rhetorical analysis of the language and argument of transdisciplinarity, with emphasis on historiographical and sociological analysis of the boundary work of defining TD. Boundary work is a composite label for the claims, activities, and structures by which individuals and groups work directly and through institutions to create, maintain, break down, and reformulate between knowledge units (Fisher, 1993). Historiographical analysis uncovers genealogies of origin, benchmark events, and shifts in meaning over time, while sociological analysis examines how practices are defined and sanctioned in networks and organizations.

To begin with historical perspective, the emergence of transdisciplinarity is dated conventionally to the first international seminar on interdisciplinarity (ID), co-sponsored in 1970 by the Organization for Economic Cooperation and Development (OECD). In the influential typology created for that meeting, TD was defined as “a common system of axioms for a set of disciplines” that transcends the narrow scope of disciplinary worldviews through an overarching synthesis. The example was anthropology conceived as a broad science of humans, although three participants sketched a fuller picture of TD. Andre Lichnerowicz advocated “the mathematic” as a universal interlanguage and common structure anchored in the deductive sciences of logic, mathematics, and information theory. Jean Piaget also believed that maturation of general structures and fundamental patterns of thought would lead to a general theory of systems or structures. Piaget, though, treated TD as a higher stage in the epistemology of interdisciplinary relationships based on reciprocal assimilations capable of producing a “general” science. In contrast, Erich Jantsch imbued TD with a strong sense of social purpose. His model of a system of science, education, and innovation was based on generalized axiomatics introduced from the top level of purpose. Interdisciplinary linkages, such as biochemistry, were still needed. Yet, they were not enough (Apostel, Berger, Briggs, & Michaud, 1972).

Of the three definitions, Piaget’s and Jantsch’s became the most widely cited and served as rhetorical warrants for two of the three major discourses of TD: one highlighting epistemological transcendence and the other problem solving. In both cases critique of traditional notions of “objectivity” and “progress” also underscored the changing relationship of science and society, foreshadowing the growing discourse of transgression. Understanding divergences and overlaps in the first two discourses requires understanding their evolution since the ground-breaking seminar in 1970.

2. The discourse of transcendence

The epistemological problem at the heart of the discourse of transcendence is the idea of unity, traced in the West to ancient Greece. Philosophers did not agree on whether a single universal explanation was possible, and some principles and subject matters were ranked higher than others. Nonetheless, the goal of unity persisted in several ideas, including the medieval Christian *summa* and the Enlightenment ambition of universal reason. The Enlightenment project of the *Encyclopédie*, however, was just that: an assembly of what was known at a time when science was gaining privilege in the hierarchy of knowledge. Yet, the quest for unity continued in movements such as Transcendentalism, the Unity of Science attempt to integrate scientific statements into a common foundation, the search for unification theories in physics, and individual propositions such as Umberto Eco’s speculation on a perfect language and E. O. Wilson’s theory of consilience. The idea of unity was also linked with the concept of holism in biology, physics, social theory, systems theory, and philosophy.

The emergence of transdisciplinarity was not a complete departure from the historical quest for unity, but it signalled the need for new syntheses at a time of growing fragmentation of knowledge and culture. In a typology of forms of

interdisciplinarity, Raymond Miller defined TD as “articulated conceptual frameworks” that transcend the narrow scope of disciplinary worldviews. Leading examples have included not only two approaches that loomed large in 1970 – general systems and structuralism – but also Marxism, phenomenology, policy sciences, and sociobiology. Holistic in intent, they proposed to reorganize the structure of knowledge by metaphorically encompassing parts of material fields that disciplines handle separately. Yet, Miller cautioned, all syntheses are not identical. Some aim to replace existing disciplinary approaches. Others are alternatives, and some are sources of coherence for working across disciplines. Proponents also claim differing types of isomorphism with the “real” world they purport to represent and greater or lesser receptivity to quantitative manipulation and empirical application. The search for formal deep structures that reflect a cognitive, biologically derived pattern of human thought, for instance, clashes with approaches grounded in material forces of production (Miller, 1982).

Subsequently, other new paradigms became aligned with transdisciplinarity, foremost among them post-structuralism, feminist theory, cultural critique, and sustainability. The connotation of synoptic scope exemplified in 1970 by anthropology also continued in interdisciplinary fields – such as area studies, cultural studies, and religious studies – and in disciplines characterized by broad scope – such as philosophy, history, and geography. The thematic of unity appeared in new organizations as well. Founded in 1983, the Institute for Interdisciplinary Research (IIR) is a self-described “think tank” that fosters understanding of the interrelatedness of areas of knowledge. It has a strong orientation to the tradition of liberal arts education, recovery of the lost unity of Renaissance learning, and “transcendental values and faith” prominent in the topics of Christianity and ethics in IIR’s journal (“[Institute for interdisciplinary research and journal of interdisciplinary studies](#)”). Founded in 1987, the Centre International de Recherches et Études Transdisciplinaire (CIRET) is advancing a new universality of thought and type of education informed by the worldview of complexity in science. CIRET’s vision of TD replaces reduction with a new principle of relativity that is multi-dimensional, transcultural, and transnational while also encompassing ethics, spirituality, and creativity (“[Centre International de Recherches et Études Transdisciplinaires](#)”). And, publishing its first issue in 2006, the journal *Integral Review* is billed as *A Transdisciplinary and Transcultural Journal For New Thought, Research, and Praxis*. Consciousness and cosmology have been strong themes in issues exploring socio-cultural, political, economic, technological, and environmental topics (“[Integral Review: A transdisciplinary and transcultural journal for new thought, research, and praxis](#)”).

As these groups indicate, unity remains a prominent theme in the discourse of transcendence, but not without qualifications. Two philosophers offered insights on what is possible in the absence of a pre-given order of things in the modern age. Reviewing the history of discourse on transdisciplinarity in 1979, Joseph Kockelmans (Kockelmans, 1979) found it has tended to center on educational and philosophical dimensions of sciences. Opinions differ, however, on whether the focus should be unification of sciences through an all-encompassing theory or a unity of worldview. They also differ on whether the weight should fall on philosophical reflection, critique, or social relevance and the role of science in society. More recently, Robert Frodeman (Frodeman, 2014) aligned TD further with a sense of social purpose. In his 2014 book *Sustainable Knowledge: A Theory of Interdisciplinarity*, Frodeman associates transdisciplinarity with co-production of knowledge by actors beyond academic walls in the public and private sectors. Echoing Wolfgang Krohn in *The Oxford Handbook of Interdisciplinarity* (Krohn, 2010), Frodeman also questions to what degree both inter- and trans-disciplinary works consist of “one-offs” that resist generalization. Heterogeneity trumps universality.

3. The discourse of problem solving

The imperative of problem solving is not new. It was fundamental to the conception of interdisciplinarity at the Social Science Research Council in the early 1920s and in defense-related research during the World War II era. In 1985, it also became central to a new conception of ID. Authors of a study commissioned by the OECD declared that *Exogenous Interdisciplinarity* had gained priority over *Endogenous University Interdisciplinarity*. The *Endogenous* originates internally within science and the university. In contrast, the *Exogenous* originates in “real problems of the community” and the demand that universities perform their pragmatic social mission (Center for Educational Research Innovation, 1982). Erich Jantsch’s vision of transdisciplinarity framed by purpose was the most explicit alignment of problem solving with TD, shaped by innovation in design and systems science and a model of education based on feedback among systems design laboratories, function-oriented departments, and discipline-oriented departments.

Jantsch’s vision continues in the work of organizations such as ATLAS, the Academy of Transdisciplinary Learning and Advanced Study. Founded in 2000, ATLAS is committed to social, environmental, economical, and ethically sustainable development, achieved by integrating knowledge and skills from all disciplines in complex systems and engineering. Today, however, that mission unfolds on the complex scale of large-scale projects and processes. ATLAS contends it is not necessary to completely reorganize the university. Yet, transdisciplinary structures are still needed to foster collaborations capable of achieving a new ontology of methods, tools, and goals (“[The ATLAS. Academy of transdisciplinary learning and advanced study](#)”). Three additional groups are prominent in the current alignment of TD with problem solving.

The first group, the Swiss-based Network for Transdisciplinary Research, known as td-net, emanated from a new approach highlighted in a benchmark Congress on transdisciplinarity held in Zurich in 2000. The underlying premise is the “real-world” argument. Complex challenges in the *Lebenswelt* – the life-world – become the focus of research questions and practices, not disciplines. This construction is sometimes classified narrowly as a Swiss or German school of TD because the approach was signalled in the late 1980s and early 1990s in Swiss and German contexts of environmental research. The

2000 meeting, however, was attended by representatives of roughly 51 countries, and the approach has been adopted widely in Europe and in the South. Case studies are reported in all fields of human interaction with natural systems (e.g., agriculture, forestry, industry, megacities) and technical development (e.g., nuclear- and biotechnology, genetics). They were also reported in fields where social, technical, and economic developments interact with elements of value and culture (e.g., aging, energy, health care, nutrition, sustainable development, landscape, housing and architecture, and urban land and waste management) (Klein et al., 2001).

Td-net shares some of the tenets of CIRET's vision, including complexity, multidimensionality, and diversity. It also supports advancement of fundamental knowledge, and acknowledges differing definitions of both inter- and transdisciplinarity. However, the Network highlights co-production of knowledge with stakeholders in society in order to achieve solutions to problems that originate in society ("[Network for Transdisciplinary Research \(td-net\)](#)"). Td-net also has a strong methodological orientation echoed in two new books. Drawing on literature review and the work of the Institute for Social-Ecological Research in Frankfurt, *Methods for Transdisciplinary Research* describes and compares methods of knowledge integration. The book eschews a universal method of research integration in favor of "informed choice" from a repertoire of methods, instruments, tools, and strategies that includes hypothesis and model building, integrative assessment procedures, boundary objects and concepts, heuristics, research questions, artifacts and products, mutual learning, and stakeholder participation. Moving between the nomothetic and the idiographic simultaneously advances general understanding and appreciation of contextualized needs. A continuous process of making adjustments also refigures TD research process from transfer and translation to generative complexities of iteration, revision, reconnection, reconciliation, and recursivity (Bergmann et al., 2012).

The second new book, *Transdisciplinary Sustainability Studies: A Heuristic Approach*, aligns TD with generativity in a heuristic-based approach to solving complex problems. Established methods still play a role. However, rules of thumb, guidelines emanating from practice, and comparative weighing of possibilities are of equal importance. The alignment of TD with heuristics couples a commitment to integration with the rationale of accountability. Editors of the book agree with Peter Weingart's contention that the purported misfit between disciplinary structure of knowledge and real-world problems is epistemologically naïve. Problems, Weingart observed, are constituted by existing knowledge and its gatekeepers (Weingart, 2000). Nevertheless, the editors respond, problems framed in terms of TD are "more 'real'" because they are defined in categories of broader social relevance and are coordinated in an "ecological rationality" of fit in particular problem contexts. Learning is also central to a cognitive process that develops *in situ*, through trial and error. And, the collaborative art of invention in heuristics underscores the role of creativity (Huutoniemi & Tapio, 2014). Others concur. Roy Bhaskar associates TD with creative use of models, analogies, and insights from a variety of fields and disciplines (Bhaskar, 2010). Doucet and Janssens also associate TD in architecture and urbanism with aesthetics and creativity. The problem solving of "architectural pragmatism" is not a reductive methodology. It has ethical-critical agency (Doucet & Janssens, 2011).

The second of the three additional groups aligns the discourse of problem solving with one of the four laws of the concept of "futures" that Ziauddin Suddar identified – "wicked" problems (Sardar, 2010). The Australian-based Integration and Implementation Sciences Network, known as I2S, centers on concepts and methods for conducting research on complex, real-world problems characterized by related features, including uncertainty, unpredictability, and risk. While not aligned overtly with TD, I2S is working through projects, a website hub, and the 2013 Global Conference on Research Integration and Implementation to advance "applied integrative research" on wicked problems. I2S supports researchers who contribute to teams addressing social, health, and environmental problems through synthesis of disciplinary and stakeholder knowledge. Two books from the Network – *Research Integration Using Dialogue Methods* (McDonald, Bammer, & Deane, 2009) and *Disciplining Interdisciplinarity* (Bammer, 2013) – advance the case for a comparative view of methods in context and an overarching new "discipline" comparable to statistics and with the potential to change both practice and policy.

The third group, based in North America, has coupled the concept of transdisciplinarity and the discourse of problem solving in a new form of "transcendent interdisciplinary research." Its claim to transcendence lies in generating new methodological and conceptual frameworks for analyzing social, economic, political, environmental, and institutional factors in health and well-being. The first prominent benchmark of this initiative, which is backed by the National Cancer Institute (NCI) in the US, was a collection of state-of-the-art articles published in 2008 ("[American Journal of Preventive Medicine](#)"). Since then efforts have centered on the emerging field of the Science of Team Science (SciTS) and NCI's Team Science Toolkit of resources ("[National Cancer Institute Team Science Toolkit](#)"). A range of stakeholders are involved, including scientists, trainees, funders, policymakers, and clinical and community partners. However, direct participation of stakeholders in society, such as patients, is not highlighted as it is in td-net. The emphasis is on scientific discoveries, educational outcomes, and translating findings into new clinical practices and public policies. SciTS research also has a strong methodological orientation to tools, instruments, and empirical measures.

A final benchmark aligns the concept of TD with innovation. It is the report of a task force sponsored in 2013–14 by the National Academies of Science in the US, entitled *Convergence: Facilitating Transdisciplinary Integration of Life Sciences, Physical Sciences, Engineering, and Beyond* (Committee on Convergence, National Research Council of the National Academies, 2014). The concept of "convergence" centers on a comprehensive synthetic framework merging knowledge from multiple fields and ideas. It is styled as the third of three revolutions, the first being the interdisciplinary field of molecular and cellular biology and the second genomics. The third revolution beckons transformative integration of life sciences, physical sciences, medicine, and engineering (The Third Revolution, 2011). It is "an expanded form of interdisciplinarity" in which bodies of specialized knowledge comprise macro domains of research activity. Like NCI and SciTS alignments of TD with a new

methodological and conceptual framework for health and wellness, the roadmap for innovation through convergence promises new inventions, treatment protocols, and approaches to education and training. Its theory of “combinatorial innovation” is tied closely with engineering and manufacturing. Nonetheless, the premise of a creative “convergence-divergence” process is widely shared in science today, signalling a break from older linear models of application to new combinations and integration generating new spin-offs.

In the 1972 book that emanated from the pioneer OCED conference on interdisciplinarity, Piaget wrote that transdisciplinarity was “still a dream.” By 2004, in the special issue of *Futures* on TD, an identifiable literature and wisdom of practice were emerging from multiplying networks and events. Research funding programs had elevated interdisciplinarity, collaboration, and even transdisciplinarity in their calls for proposals, and interest was growing in the public sector. However, in the decade since then financial exigencies and retrenchment have dampened prospects. Moreover, as the *Convergence* report indicates, the same obstacles that have plagued interdisciplinary programs for decades still confront transdisciplinary initiatives. The pragmatic, philosophical, and political implications take center stage in the discourse of transgression.

4. The discourse of transgression

In addition to “wicked,” Sarder posited the connotation of being “skeptical” when defining the concept of “futures” (Sarder, 2010). Its characteristics – questioning dominant axioms and assumptions while exposing their contradictions, paradoxes, and conflicts – lie at the heart of the discourse of transgression. This discourse moves beyond instrumental integration to critique, reimagine, and reformulate the status quo. With that imperative in mind, some have aligned TD with the concept of “post-normal science.” In Funtowicz and Ravetz’s classic definition of post-normal science, the problems of modern society are interdependent and not isolated to particular sectors or disciplines. They are driven by complex cause-effect relationships and exhibit high divergence of values and factual knowledge (Funtowicz & Ravetz, 1993). When TD is aligned with both post-normal science and Rittel and Webber’s definition of wicked problems (Rittel & Webber, 1972), the discourses of transgression and problem solving combine, breaking free of reductionist and mechanistic assumptions about the ways things are related, how systems operate, and the expectation science delivers a single “best” solution or final answers.

Transdisciplinarity and the discourse of transgression also became aligned in the late 20th century with humanities and interdisciplinary fields forged in critique. Ronald Schleifer (Schleifer, 2002) associated a new form of interdisciplinarity in humanities with theoretical approaches and transdisciplinary cultural study of social and intellectual formations that breach canons of wholeness. The transdisciplinary operation of cultural studies, Douglas Kellner stipulated, draws on a range of fields to theorize the complexity and contradictions of media/culture/communications, moving from text to context while pushing boundaries of class, gender, race, ethnicity, and other identities (Kellner, 1988). Likewise, in women’s and gender studies, Dölling and Hark (Dölling & Hark, 2000) associated TD with critical evaluation of terms, concepts, and methods that transgress disciplinary boundaries. And, in Canadian studies, Jill Vickers linked TD and anti-disciplinarity with movements that reject disciplinarity in whole or in part while raising questions of socio-political justice. The most important transdisciplinary fields have been women’s, native/aboriginal, cultural communications, regional, northern (circumpolar), urban, and environmental studies (Vickers, 1997).

Calls for TD also arrived at a moment of wider crisis in the discourse of human rights accountability, a context Upendra Baxi (Baxi, 2000) emphasized at a 1998 international meeting on transdisciplinarity. Privileged and dominant forms of knowledge established genres, protocols, canons, and formations that marginalized other ways of knowing. In response, new modes of knowledge, discourse, and institutional frameworks were demanded across all sectors of academic, private, and public life. Baxi highlighted in particular gaps between Western and other traditions, between official colonial and indigenous approaches, and between esoteric knowledge and organic knowledge. One of the transgressive purposes of TD became renouncing the logic of instrumental reason and the protocols and truth claims of disciplinary conventions. This effort is not solely philosophical, however; the discourse of transgression became entwined with democratic participation in problem solving. This development is apparent in extension of the concept of Mode 2 knowledge production to include the concept of “socially robust knowledge.”

In 1994, Gibbons and colleagues proposed that a new mode of knowledge production is fostering synthetic reconfiguration and recontextualization of knowledge. In contrast to Mode 1 – characterized by hierarchical, homogeneous, and discipline-based work – the defining traits of the new Mode 2 include complexity, non-linearity, heterogeneity, and transdisciplinarity. New configurations of research work are being generated continuously, and a new social distribution of knowledge is occurring as a wider range of organizations and stakeholders contribute skills and expertise to problem-solving. As organizational boundaries of control blur, underlying notions of competence are also redefined and new criteria of evaluation needed. Gibbons et al. initially highlighted instrumental contexts of application and use, such as aircraft design, pharmaceuticals, electronics, and other industrial and private sector product development (Gibbons et al., 1994). In 2001, however, Nowotny, Gibbons, and Scott extended Mode 2 theory in arguing that contextualization of problems requires participation in the agora of public debate. When lay perspective knowledge and alternative knowledge are recognized, a shift occurs from solely “reliable scientific knowledge” to inclusion of “socially robust knowledge” that transgresses the expert/lay dichotomy while fostering new partnerships between the academy and society (Nowotny, Scott, & Gibbons, 2001).

5. Conclusion: overlapping discourses

This investigation has emphasized academic and professional contexts, but there are also many personal outlooks that would be deemed “transdisciplinary” today, including the earlier worldviews of Michael Polyani, Wendell Berry, Michel Foucault, Stephen Jay Gould, and Isaiah Berlin as well as more recent efforts to forge a collective eco/environmental discourse by Thomas Berry, Henryk Skolimowski, and Chris Ansell. Moreover, there is a long history in social theory of efforts to construct overarching frameworks, including the earlier work of Emile Durkheim, Georg Simmel, Max Weber, Robert Park, and Talcott Parsons as well as efforts by Anthony Giddens to create a synthesis that would yield a new structuration theory, Randall Collins’s call for a comprehensive theory of society linking micro-level processes to macro-level structures, Jeffrey Alexander’s effort to achieve convergence of all major classical and contemporary sociological theories, Alain Touraine’s call for reunification based on a general representation of society and vision of change, Jürgen Habermas’s encompassing theory of communicative action, and Niklas Luhmann’s synthetic framework for analysis of autopoietic, or self-referential, social systems (Camici & Joas, 2004).

The scope of transdisciplinarity also ranges from the global to the individual. At a global level, the First World Knowledge Dialogue in Switzerland in 2006 aimed to bridge the two cultures of natural/technical sciences and human/social sciences. Although pitched at a broad level, the transdisciplinary concept of “world dialogue” is grounded in the testing ground of case studies. The meeting’s hosts recognized that complete unification can never be achieved, but a systems approach to overarching themes of complexity and origins and migrations of modern humans can be a locus for communication and cooperation (Darbellay, Cockell, Billotte, & Waldvogel, 2008). At the individual level, Tanya Augsburg has synthesized defining traits of a transdisciplinary individual. The heart of the concept is the notion of a “transdisciplinary attitude,” introduced by Joseph Kockelmans (Kockelmans, 1979) though credited to Basarab Nicolescu and colleagues in CIRET. Augsburg identified multiple characteristics of a transdisciplinary individual: foremost among them acceptance of different levels of reality, openness to other views, risk taking and willingness to transgress boundaries, and a willingness to learn and creative inquiry (Augsburg, 2014).

The cumulative force of so many personal and social efforts to achieve transdisciplinarity has led to speculation about whether a meta-TD might unify separate approaches. The history of transdisciplinarity suggests that will not be the case. The boundary work of emphasis will continue to vary across discourses. As an epistemological project, TD will be aligned more closely with the discourse of transcendence. As a method of knowledge production, it will be linked with utilitarian objectives, although they range from manufacturing new products to new protocols for health care and environmental sustainability. As a form of critique, it will continue to interrogate the structure and logic of the university and its role in society. Even with distinct patterns of definition, however, discourses are not air-tight categories. Two recent books accentuate current overlaps.

Introducing a 2011 anthology of essays on *Transdisciplinary Knowledge Production in Architecture and Urbanism*, Isabelle Doucet and Nels Janssens emphasize reflexive interaction rather than strict separation of discourses. They argue that new hybrid modes of inquiry, practice, and learning have the capacity to overcome past schisms of theory, history, and practice as well as critical theory and design. TD places ethics, aesthetics, and creativity inside of disciplinary and professional work, thereby incorporating social and political, normative and ethical questions. It brings new objects into view, places practices in new configurations, contextualizes and resituates both theory and learning, and heightens awareness of hybridization by incorporating once excluded forms of knowledge including the understandings of lay people. A TD vision of architecture, urbanism, and design joins the epistemological perspective of systems theory with an “in-practice model” of design and learning that simultaneously transgresses older methods in favor of a more comprehensive and transformative approach to problem solving. Hybridization also recognizes the greater heterogeneity and relationality of knowledge today. Tasks lie at the boundaries and in the spaces between systems and subsystems, requiring collaboration among a mix of actors (Doucet & Janssens, 2011).

The second book, released in 2014, attempts to bridge Western philosophy of science and African cosmology in the context of real-world problem solving with stakeholders in society. The publisher, the Mapungubwe Institute for Strategic Reflection (MISTRA), was launched in 2011. The Institute centered on eight research projects and another project based on conceptualization and application of TD in intellectual discourse and research. The book situates the discourse of transcendence, in the form of an interconnected and holistic system, within the context of problems such as climate change, poverty, unemployment, and anomie. At the same time, it is transgressive in moving beyond older approaches and the privileging of Western precedents, although the authors devote a great deal of time to explicating those precedents. They portray a lineage reaching from ancient Greece to the foundational work of Francis Bacon, John Locke, and Immanuel Kant to 20th-century arguments against method by Paul Feyerabend, Hans-Georg Gadamer, and Sheldon Wolin to conceptual frameworks of Gaston Bachelard, Michel Foucault, and Gary Gutting. Reaching the point at which “transdisciplinarity” became a recognized term, in the 1970 OECD typology, they highlight alignment of TD with complexity in the work of Nicolescu, Edgar Morin, Alfonso Moutouri, and Roy Bhaskar. The African lineage they trace spans ancient holistic cosmology and the contemporary work of Paul Cilliers, Dani Nabudere’s concept of Afrikology, and a repeated admonition to situate “transdisciplinarity at the specific institution” (Du Plessis, Sehume, & Martin, 2001).

The underlying concepts in these two books – hybridity and contextualization – bring together imperatives of transcendence, problem solving, and transgression. Transdisciplinarity has always been about imagining futures. Is it though, to recall Piaget, “still a dream”? The track record of efforts reveals an eclectic mix of recovery projects and campaigns for new

frameworks. However, the concrete projects of CIRET, ATLAS, td-net, SciTS, and exemplars of socially robust knowledge and convergence are rich in actualization. Doucet and Janssens's volume also highlights examples of metrofitting, moving cities, and rapid cities as well as citizen participation and collaborative approaches to training practitioners that incorporate syncretic hybrid approaches in dialogue with both Mode 1 and Mode 2. The Mapungubwe Institute fosters transformative work in the contexts of post-colonial African universities, sustainability energy, social justice, and new structural models of universities outside South Africa. Predicting the future of transdisciplinarity is as tricky as predicting the future itself. Yet, discourse analysis has revealed a clear historical shift from traditional epistemology to problem solving, from the pre-given to the emergent, and from universality to contextuality and subjectivity.

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