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Founding transdisciplinary knowledge production in critical realism: implications and benefits

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ABSTRACT
This article explains the implications and benefits of founding transdisciplinary collaborations of knowledge production in critical realism. We call such equal partnerships of researchers and practitioners knowledge alliances. Drawing on the distinction between the referent to which we refer (the object that our research is about) and our references (our research about this object), we show that practitioners can contribute to the process of knowledge production by providing access to referents and producing references but also by achieving societal relevance. In order to accomplish excellence, knowledge production should be organized in ways that engage different types of knowledge in a constructive interplay and use the respective strong points of researchers and practitioners. Abduction and retroduction, two modes of inference vital to critical realism, are particularly inclined to benefit from involving practitioners in knowledge production. We call such an approach potential-oriented and put it in contrast to problem-orientation and the empiricism of evidence-based research and policy-making.

KEYWORDS
Transdisciplinarity; knowledge alliance; critical realism; social cohesion; urban development

Introduction
The authors of this article have been conducting research on increasing urban and societal cleavages and how to deal with them for many years. In many of these projects, we have worked together with urban inhabitants, public employees, civil society organizations and social movements, seeing them as representatives of practical knowledge. That is, their knowledge is different from scientific knowledge. We call these representatives of practical knowledge ‘practitioners’; they are actors who deal with urban and societal cleavages, such as inequalities, poverty and social exclusion. Such collaborations between researchers and practitioners reflect wider trends and growing commitments by funders to support ‘engagement’, ‘involvement’ and ‘co-production’ with the envisaged end-users of research. This transdisciplinary orientation, combining ‘interdisciplinarity with the participation of extra-scientific actors’ (Jahn, Bergmann, and Keil 2012, 5), 1 is common across many disciplines and methodological traditions.

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Among the variety of names of such collaborations, the term ‘knowledge alliances’ (KAs) emphasizes the desirable equality in the partnerships between representatives of different types of knowledge. It has emerged out of our joint involvement in the EU-wide social platform Social Polis–Social Platform on Cities and Social Cohesion (2007–2010). The overall objective of this platform was the development of a research agenda to foster social cohesion in cities through the critical analysis of contemporary research (Novy, Coimbra Swiatek, and Moularet 2012); and the establishment of a multi-stakeholder social platform for dialogue and agenda setting (Cassinari et al. 2011). The term ‘knowledge alliances’ was introduced in Europe 2020, however, with a definition limited to alliances between ‘education and business’. A wider definition was used by the Commission for a Socially Sustainable Malmö (so-called Malmö Commission), set up by the local government and inspired by the World Health Organisation. One of its two comprehensive recommendations to combat increasing health inequities was the establishment of knowledge alliances, ‘focused on combining excellence and relevance’ (Stigendal and Östergren 2013, 131).

On the basis of different transdisciplinary projects, such as the ones referred to above, we have experienced that KAs do not only potentially produce research results but also practical knowledge and other benefits, like empowering practitioners or strengthening their dignity. Therefore, KAs deal with knowledge production in a wider sense than research. To succeed with such knowledge production, a KA should be based on critical realism (Bhaskar [1989] 2010). We call this application of critical realism a potential-oriented approach. The term reflects the shift in focus, suggested by critical realism, from actual events to the generative mechanisms that cause these events, also called causal powers (Danermark et al. 2005, 5.198). The approach could, therefore, just as well have been called generative mechanisms- or causal powers-oriented approach. However, the term potential-oriented has also emerged on the basis of collaborations with practitioners, with an understanding of the meaning of ‘potential’, an endeavour on highlighting potentials rather than problems and a commitment to take underlying causes seriously. The use of this term facilitates communication with collaborating practitioners and focuses on the know-how of local professionals and the tacit knowledge of the disadvantaged.

The dominant approach in dealing with poverty, inequality, segregation and social exclusion has been evidence-based policy-making based on empiricist epistemology (Solesbury 2001). It relies on statistical correlations that ‘remain the socially sanctioned way to arrive at “evidence-based” research to inform public policy’ (Bhaskar, Danermark, and Price 2018, 76). Empiricists concentrate on identifying and naming constant conjunctions of observable phenomena. Such explanatory models tend to focus on symptoms, not causes (Jessop 2015), neglecting the crucial distinction between the problems and how these are defined. Instead, the problems tend to be taken for granted. Therefore, we call this approach problem-oriented. It reduces the poor and excluded to objects with measurable characteristics.

The audience for this article is not primarily the practitioners, for whom we have already written many articles and books, but rather fellow researchers. Just as Bhaskar, Danermark, and Price (2018) have mobilized critical realism to provide a theoretical justification for interdisciplinarity, we attempt to explain how critical realism enriches collaborations with practitioners too, here conceptualized as transdisciplinarity. Our objective is to
explain how critical realism favours knowledge alliances and, by referring to examples, how it can be applied in concrete knowledge production.

A potential-oriented approach

In our collaboration with practitioners, we have ascertained that it is crucial to use a potential-oriented approach, as both signifier and signified; that is, the term ‘potential-oriented’ is the signifier, while the signified is a concept for potential-oriented forms of collaboration. As a term, ‘potential-oriented’ appeals to those who want to transform existing situations of exclusion and segregation as well as those who believe in the potentials of ordinary people, e.g. young migrants. It may offer a counter to the TINA-syndrome - which suggests that there is no alternative to neoliberal capitalism (Bhaskar, Danermark, and Price 2018, 59–60) – and inspire the notion that There are many and real alternatives (TAMARA). The term ‘potential-oriented’ implies positive connotations: it sustains the dignity of those who suffer from unemployment, social exclusion or poverty. In line with the pedagogy of liberation (Freire 1996), the term may urge us to see the poor not only as victims of deprivation and oppression but also as agents of transformation.

By stressing positive potentials, we are able to avoid the widespread focus on deficiencies. Examples of positive potentials range from the intercultural competence of young people to the emancipatory potential of the theatre of the oppressed (Stigendal 2018) or the deinstitutionalization of social services like Housing First (Weinzierl, Wukovitsch, and Novy 2016). Nevertheless, the potential-oriented approach has also allowed us to talk about negative potentials, such as the mechanisms causing the inequality inherent in capitalist societies (Stigendal 2018).

Our ability to be sensitive to the ways that practitioners communicate, think and express themselves has not developed automatically; and neither has our concern with potentials. For instance, in 2006, at the beginning of one collaboration, known as Hauptschule trifft Hochschule (Secondary Modern School meets University) – which has become a lasting KA – the principal of the school warned us not to behave like ‘vampires’, extracting data and then disappearing. She, therefore, insisted that research must benefit both the university and the Hauptschule. In long discussions and small pilot projects, together with university students and the Viennese Paulo Freire Centre, a new research culture was therefore implemented that we at that time described as a ‘learning and researching partnership’ (Novy 2012, 138). The innovation in knowledge production consisted in choosing research objects that the pupils were ‘experts’ in, thus, allowing them to collaborate on an equal footing. The first topic to be addressed was the experiences of pupils who have more than one homeland. The researchers accepted the premise that they are to learn a lot from the pupils and teachers as everyday experts; while the latter acknowledged that researchers contribute valuable theoretical knowledge on cultural political economy in general and the Austrian labour market and school system in particular. Over the years, this learning and research partnership has realized further benefits. The researchers have helped the school to get access to project funding and many of the involved university students have become mentors to the pupils and helped to build bridges with mainstream society. In line with Paulo Freire’s pedagogy, the teachers have become aware of the potentials of their pupils and increasingly focus on their social competence, organizational skills and creative capacities.
Social Polis was another major transdisciplinary project inviting practitioners from different countries to work with researchers on issues of social cohesion. The project was ambitious as it involved diverse actors from all over Europe, but it underestimated the difficulties resulting from the diverse use of the term ‘social cohesion’ across Europe and its different understandings (Stigendal 2010). In Swedish, the corresponding term to ‘social cohesion’ is hardly used and there is no general understanding of its meaning; this is in contrast to the situation in the EU, where there is a proper social cohesion policy (Crescenzi and Giua 2016). Hence, the 40 practitioners invited in Malmö to participate in Social Polis had difficulties understanding what the researchers were talking about, as it seemed that the researchers had already decided about the issue both regarding its term (the signifier) and its meaning (the signified). The lack of familiarity with the issue – its name as well as its meaning – created uncertainty and alienation among the practitioners. ‘What does the issue called social cohesion include?’, practitioners ask. ‘Is the work that I do as a teacher or social worker included? Are my experiences of interest for research on social cohesion? What problems and experiences am I allowed to discuss?’ Retrospectively, the project could have been better prepared regarding the acknowledgement of power asymmetries, recognizing such difficulties and opening up to a wider terminology.

We find the distinction between signifier and signified useful, as it illuminates common problems in the collaboration of researchers and practitioners, as described above. It explains what sometimes happens, if researchers and practitioners cease to collaborate, like in the case of the Malmö Commission. Policy-makers in Malmö have launched many KAs in the aftermath of the Commission, but usually without involving researchers. The term has therefore become popular, albeit without the involvement of academic knowledge on underlying causes and mechanisms. We get the impression that under these conditions such partnerships tend to reproduce existing power relations, privileging public servants over inhabitants. These forms of KA might overcome a silo mentality to policymaking and enable the sharing of professional experience, but do not produce knowledge on causes and potentials.

Distinguishing between a term and its content has improved the communication with practitioners. We have, for example, urged practitioners to be aware about using a specific term as others might have a very different understanding of its meaning. Nobody should assume that everybody agrees, just because all use the same terms. But with all due deference to the distinction between signifiers and signified, analysis cannot be limited to this distinction, as one would commit the ‘epistemic fallacy’ of assuming that reality corresponds to the knowledge that we have about it (Jessop 2015, 239). This assumption constitutes the basis of the philosophical position called social constructivism (Sum and Jessop 2013, 131). The criticism of social constructivism in this article concerns what some critical realists (such as Sayer 2000, 90) regard as the strong version, rejected by Bhaskar, Danermark, and Price (2018, 81) as ‘morally irresponsible and outrageous’ (for a defense of ‘weak social constructivism’ see also Elder-Vass 2012).

Knowledge as both reference and referent

In contrast to empiricism and social constructivism, critical realism claims that ‘there are not only signifiers (e.g. words) and signifieds (concepts) but also referents’ (Fairclough, Jessop, and Sayer 2002, 5). This means that knowledge differs from what it refers to. We
make sense and meaning of reality, for instance, by producing knowledge. By doing so, we create references, unities of signifiers and signifieds, to what we make sense of, the referents, that can be both observable and non-observable objects. These real phenomena are the objects that we focus on (Sum and Jessop 2013).

As observable objects, referents belong to the level of reality that critical realism calls the empirical. While we make sense of these impressions and experiences, we can understand them as expressing a specific non-observable content associated, in turn, with the second level of reality, called the actual. Furthermore, the stratified ontology of critical realism identifies the third level, called the real, not only embracing empirical and actual objects but also non-observable and above-described potentials. According to Sayer (2000, 11), the real is whatever exists, and that indeed includes knowledge, whether it exists as a potential or as actualized and expressed in an analysis.

Thus, knowledge can be both a reference and a referent. As the latter, it exists regardless of what each one of us as individuals thinks about it. In order to be able to use it, however, we need to make clear to ourselves and others what the knowledge is about. This requires work and takes time. To the extent that we succeed, knowledge becomes a reference for us, thus, also meaning that we reproduce it as a referent, i.e. something that some actors have referred to in the past and others might learn from it in the future.

The distinction between references and referents can explain some of the difficulties in collaborations between researchers and practitioners. Practitioners have, for example, probably had experiences of similar referents that the researchers referred to as ‘social cohesion’ but practitioners might call it and understand it as something different, for instance as ‘integration’ or ‘belongingness’.

Thus, practitioners try to make sense and meaning of the reality they experience, just as researchers. Practitioners might, perhaps, prefer to express the sense and meaning that they make of their experiences by using other non-academic references to capture the multidimensionality of a referent. Within the context of Social Polis, two young persons from Malmö, aged around 20, were invited to an international conference with 200 participants in Vienna in 2009. They worked at a place called the Green House, a meeting place for young people offering a variety of activities for young residents in a disadvantaged neighbourhood and run by a group of locally recruited young people, employed by the city district. At the conference, they prepared an exhibition, using images and posters, and also talked about their every-day experiences by using PPT during the presentation. Their contributions in this setting certainly provided the conference with new referents, not analytically reflected, but still very valuable and rich, that called on the conference researchers to be conceptualized and explained (Stigendal 2010).

This might constitute a challenge for researchers but could also provide opportunities to develop a proper use of imaginaries and metaphors. What the practitioners express, can it also be regarded as knowledge? The answer depends on what we mean by knowledge.

**Recognizing different types of knowledge**

Whoever wants to produce knowledge, needs to appropriate existing knowledge and make it his/her own. Thereby, knowledge becomes personal, something the appropriator knows what it is about and how to use it. Such personal knowledge differs from the collective knowledge that pre-exists us and to which we may contribute, but only by turning
it into our own personal knowledge first. Collective knowledge exists as commons among us, significantly structured by power relations.

Learning means to link up with collective knowledge, but not in a passive way. If we want to learn, we have to appropriate knowledge, and this requires work. Marks are supposed to express to what extent we have succeeded in learning, albeit their validity should not be taken for granted. Moreover, learning also occurs outside the educational institutions and we should assume that everybody has knowledge. It is obvious, however, that knowledge differs. The knowledge of a researcher is not the same as the knowledge of a practitioner. Furthermore, this difference cannot be understood on the same quantitative scale. The former is not necessarily better than the latter, but they are simply qualitatively different.

This qualitative difference has been highlighted from the early beginning of Western thinking, in particular by Aristotle in his distinction between *episteme, techne* and *phronesis* (Bernstein [1983] 2011; Flyvbjerg 2001, 57). According to Flyvbjerg (2001, 2) ‘*phronesis goes beyond both analytical, scientific knowledge (*episteme*) and technical knowledge or know-how (*techne*) and involves judgments and decisions made in the manner of virtuoso social and political actors.’ For the purpose of this article, we will not make much use of the distinction between *techne* and *phronesis* but treat them collectively as practical knowledge. In turn, we will distinguish between two types of knowledge regarding *episteme*, depending on what level of reality it primarily refers to. One type refers to observable phenomena and can be called empirical knowledge; the other type is called theoretical, focusing on identifying causal relationships and transfactual mechanisms. Its primary referents belong to the levels of the actual and the real.

The distinction between these three types of knowledge is not exclusive and absolute but concerns the primary referents. Empirical knowledge, for example, always also – explicitly as well as implicitly – includes theory, that distinguishes it from information and experience. It cannot, for instance, be regarded as a pure enumeration of facts. Similarly, what we call theoretical knowledge usually also consists of empirical referents, even if only as examples. In turn, the primary referent for practical knowledge is practice. Being able to write on a computer (*techne*) or to solve conflicts, synthesize knowledge and evaluate arguments (*phronesis*) is what we mean by practical knowledge.

We favour research that organizes knowledge production as an interplay of different types of knowledge. The layered ontology of critical realism facilitates such a broader understanding of knowledge, justified by its rich conceptualization of potentials. For this reason, we need to start to assume the existence of the predominantly practical knowledge of practitioners as an abstraction separated from its particular context.

Social constructivists, particularly the strong version of it, cannot recognize this (Sayer 2000, 90), as – according to their ontology – there is no reality outside its corresponding knowledge. Inclined to idealism, they do not allow themselves to assess the efficacy of the extra-discursive. Whatever practitioners bring along, it cannot be knowledge as long as it has not been named as such. And if it does qualify as knowledge, it still depends on the constructions of the social constructivists. By exclusively dealing with texts and discourses, they grant themselves a privileged power position as experts in interpretation. This introduces a hierarchy in interpretative social research to the detriment of interpretations of ordinary people, as some social construals ‘are more equal than others in their impact on social construction’ (Sum and Jessop 2013, 163).
According to empiricism (in its literal interpretation), potentials do not exist, as they cannot be pointed out and observed. The scientist is expected to concentrate on identifying and naming constant conjunctions of observable phenomena. If, for example, a pupil at school loses his/her self-control, empiricists tend to attribute it to other observable phenomena, like the family, since such a conjunction has been observed in several research projects. Empiricism does not allow for an understanding of the potentials inherent in the organization of the school that may lead to certain pupils to losing their self-control. The stratified Austrian school system, separating pupils at the age of ten, is a main cause for uneven educational outcomes and labour market segmentation. It tends to impede access to higher education for pupils in *Hauptschule*. For critical realism, it is perfectly legitimate to draw such a conclusion, of course provided that we possess knowledge on respective welfare regimes and the potentials of school organizations. A teacher may draw a similar conclusion, although perhaps based on experiences and as part of his/her predominantly practical knowledge, in this case *phronesis*. The main reason for the success of *Hauptschule trifft Hochschule* consisted in the exchange of these different forms of knowledge, both critical of the current organization of the Austrian school system.

Empiricists, however, stick to what seem to be the problems and the resulting proposed solutions and cannot identify the actualized potentials causing the problems. For this reason, we call such an approach, based on evidence-based policy-making, problem-oriented. Its underlying positivism was already exposed to devastating critique more than 30 years ago in geography (Harvey [1973] 2010; Sayer 1985) and still earlier in social science by C. Wright Mills ([1959] 2000). It has, however, regained dominance and one reason, therefore, is its ability to claim excellence. In order to show why and how the involvement of practitioners in research can overcome such a restricted, empiricist understanding of academic excellence, a broader and theoretically founded definition of excellence is crucial.

**Incorporating relevance into excellence**

There has been an increasing interest in collaborations between researchers and practitioners. In 2009, the European Commission published a respective report by the MASIS (Monitoring Policy and Research Activities on Science in Society in Europe) Expert Group called *Challenging Futures of Science in Society* (see Siune et al. 2009). The report highlights the trend of increasing the relevance of science to society (societal relevance as we will call it). However, at the same time, there has been an opposing trend, reaffirming the autonomy of science under the traditional notion of ‘excellence’, consolidated by the continuing emphasis on publication indicators in evaluations. The MASIS report criticizes this notion of excellence, which runs the risk of endangering the pursuit of societal relevance and favours ‘decontextualized and globalized science while context-related and more local research, dedicated to specific problem solving, is disadvantaged’ (Siune et al. 2009, 16–17). The MASIS report insists that societal relevance is not contradictory to excellence and urges for a combination of both aspects.

What makes science excellent, however, depends on the approach to knowledge (epistemology) and such an approach has to be found in a certain ontology. Critical realism provides a basis for an ‘anti-imperialist’ (Bhaskar, Danermark, and Price 2018, 81) meta-
theoretical perspective, ‘intrinsically supportive of interdisciplinarity’ (Bhaskar, Danermark, and Price 2018, 82) that mobilizes different modes of inference: deduction, induction, abduction and retroduction. The deductive form of inference is of central importance in all sciences and should be applied in the assessment of the logical validity in scientific argumentation. In contrast, the inductive form of inference should be ascribed a far more limited validity, since, as Danermark et al. suggest, ‘the objects of science are not primarily empirical regularities, but structures and mechanisms’ (2005, 87). This observation has implications for the collaboration with practitioners.

If knowledge is exclusively regarded to be logically derived from theories, those without knowledge about these theories cannot contribute. Similarly, if knowledge is only valid if induced from empirical observations, in line with the form of inference called induction, those with no skills in statistical analysis have no access to knowledge production. If deduction and induction structure the research process, the knowledge of practitioners is irrelevant and they are disempowered in regard to knowledge production precluding equality in partnerships between researchers and practitioners.

This changes once the other two modes of inference gain importance in the research design. Abduction, associated with pragmatism, advances from one perspective to another and, thus, permits perceiving something particular as something different. Abduction does not claim validity based on formal logic, but due to its usefulness, or in other words, relevance. Retroduction is a form of inference questioning how something that appears to exist can exist and we will return to that below.

Together, these four forms of inference enable us to move from the imagined concrete to more and more simple abstractions. Then, scientific work should proceed by incorporating more determinations at lower levels of abstraction, moving from abstract-simple to concrete-complex analyses (Jessop 2015, 243; Marx and Engels 1986, 37). It is a ‘reflexive spiral movement’ of ‘refining conceptual entry points in the light of substantive findings and deepening, widening, and modifying the empirical analysis’ (Moulaert, Jessop, and Mehmood 2016, 179).

Danermark et al. (2005, 113) regard all forms of inference as complementary in an explaining social science. They are part of the reason why critical realism can be described as ‘intrinsically supportive of interdisciplinarity’ (Bhaskar, Danermark, and Price 2018, 82), and of transdisciplinarity, we would add. While the researchers benefit from the quality of the knowledge produced, benefits for the practitioners are usually not restricted to acquiring knowledge. While policy-makers, professionals and street workers might derive orientation and legitimacy for their activities, the participation of the disadvantaged, excluded or oppressed in KAs as knowledgeable subjects has raised their dignity, built bridges and increased self-esteem – key elements for self- and collective empowerment. Critical realism endows KAs with the potential to favour equality in partnerships between researchers and practitioners.

In the next chapter, we will explore this potential and its contributions to scientific excellence. However, a definition of excellence is required and, in line with critical realism, also a definition of relevance. Starting with the latter, relevance should not be seen as something external to excellence but fundamental for all science (Sayer 1992, 70). According to Danermark et al. (2005, 25) ‘the validity of the knowledge/concepts we have is primarily a question of how well the knowledge functions in practice’. We suggest that this use-value (Marx 1996, 45) of scientific knowledge is to be assessed,
firstly, with regard to what it explains about its referent object, at whatever level, and, secondly, its explanatory consistency as a reference object. Thirdly, research should be assessed according to its societal relevance, defined as its usefulness in a wider societal context. We will treat these three as validity criteria, complementary in the assessments of scientific excellence. In the next chapter, we use the three criteria to explain the contributions of practitioners to excellent research.

Knowledge alliances

As stated in the introductory chapter, KAs consist of equal partnerships between researchers and practitioners in line with the notions of interactive research (Svensson, Ellström, and Brulin 2007) and transdisciplinarity (Felt et al. 2016; Hadorn et al. 2008a, 2008b; Miciukiewicz et al. 2012). The partners enter a KA from different directions, with different interests and varying combinations of the three forms of knowledge. The challenge consists in organizing such multi-stakeholder alliances in a way that these differences can thrive and benefit each other in a mutual process of knowledge production (Novy, Habersack, and Schaller 2013).

Put simply, practitioners and researchers meet in the actual, the former approaching it from the empirically observable and the latter from the potential. While practitioners contribute knowledge, mainly of a type called practical, researchers are expected to bring along the types of knowledge called empirical and theoretical. In research aiming towards excellency, knowledge production should be organized in ways that bring these different types of knowledge in a constructive interaction.

In the previous section, we have explained how critical realism, in contrast to other philosophical positions and methodological traditions, broadens our understanding of knowledge and modes of inference. In this section, we will show how critical realism can be mobilized in KAs by clarifying the role of practitioners in excellent research, or, in other words, their contribution to the above described three criteria of excellent research: referents, references and societal relevance.

Accessing referents

Just as in any other process of production, the referents are the raw material that knowledge production aims to make sense of and improve our understanding of. The accessibility of these referents, thus, becomes a key issue. Certainly, there is much to learn from empiricist and constructivist methods in accessing referents and producing knowledge on the basis of it (Bhaskar, Danermark, and Price 2018). However, these methods suffer from certain limitations and insufficiencies, whenever academics consider it their privilege to carry them through. A statistical survey can, for example, be flawed by the choice of questions that some might understand, and others might not; some see as provocative and others do not; some understand in one way and others in another. This is particularly the case when dealing with issues like exclusion, multiculturality and marginalization. Conducting personal interviews can be difficult due to differences in language, culture, class and/or age between the interviewer and the interviewee. The latter might not even agree to be interviewed or the interviewer may not be able to find potential interviewees.

The access to referents can be improved by working together with practitioners, since they often are gatekeepers for certain types of information on specific non-conformist or
deviant groups and possess practical knowledge on their everyday life, such as housing conditions or interactions with residents. In several surveys on living conditions conducted in Malmö, municipal workers and young adults were released from their work duties for conducting interviews. In the largest survey, 100 municipal workers, divided into three consecutive rounds lasting for three years, carried out 3700 interviews with residents, mainly in their private homes. The regular workplace of these municipal workers was in the areas where they carried out the interviews and they were given paid leave to conduct them (Stigendal and Östergren 2013).

As these projects required special knowledge to conduct interviews, tailor-made and problem-based courses were included that built on and supplemented the participants’ own knowledge. The latter included knowledge on the population regarding its composition, resources and needs and challenges in the neighbourhoods like crime, loneliness and other issues. They had knowledge of the housing areas and their facilities, stigmatized neighbourhoods and infrastructures. They knew a lot about how to interact with residents. Their knowledge was also used to formulate questions. Furthermore, they had experience-based knowledge as service providers to approach service users and to deal with the power gap. Due to all this knowledge, the practitioners achieved decisive importance in getting access to people and in the formulation and asking of questions. Furthermore, they contributed by bridging differences and improving communication with people, bearing in mind the need to understand the local dialect as well as other languages (role of interpreters), also in terms of culture, for example, regarding young people or immigrants. They were also decisive in getting access to information of many other different kinds, not least regarding rumours or popular culture.

To capture their experiences from interviewing residents in their homes, writing workshops were organized, supporting practitioners to write about impressions from each interview. They were also encouraged to reflect on the interview and in that way express as well as develop their own knowledge. Thereby, hundreds of stories were collected, many of them rich in content, which the researcher could resort to in an in-depth analysis of the segregated living conditions. In the scientific publications emerging from the projects, quotes from such stories served both as illustrations and as sources of reflection, qualitatively supplementing the quantitative outputs from the survey interview. To give an example of positive potentials not taken advantage of:

Of the interviews I’ve had so far, it’s especially a 67-year-old woman who I think I will remember for a long time. She could not speak Swedish, she could not read or write, but it seemed like she could do many other things that in our high-tech society are not always appreciated enough. She was a widow, mother of several children, grandmother of several grandchildren. She had left Somalia five years ago. … ‘You know I cannot read and write, but I can recite many poems by heart’, said Aya, when the conversation came to deal with books, culture and leisure. … Aya had something universal about her. I could not be unmoved by her personality. She inspired. (Stigendal 2016, 313)

Producing references

Aside from providing access to referents, the practitioners have contributed to the process of knowledge production by shaping a creative, stimulating and inquisitive as well as demanding context for it. They have also contributed by perceiving things differently,
in line with abduction, and have, thereby, challenged the views of the researchers, sometimes forcing them to elaborate the arguments, sometimes enabling them to sharpen the arguments. Furthermore, the practitioners have contributed to retroductive inferences by suggesting the kind of ideas called counterfactual. These are questions like ‘What if?’ and ‘How would it be if … ?’. Danermark et al. (2005, 101) describe counterfactual thinking as fundamental for all retroduction. In counterfactual thinking, we use our experiences and knowledge on the social reality as well as our capacity to abstract. Danermark et al. (2005) deal with science, but obviously counterfactual thinking also is a concern for others, like practitioners working in neighbourhoods characterized by social exclusion. They must ask themselves many questions like the cited ones above. Doing this develops their potential to think counterfactually, at least regarding those interested in potentials and change.

Deduction and induction must be learned through education. Thus, the potential of applying both is inherent to the individual. Therefore, science–society interaction exclusively based on a deductive or inductive methodology disadvantages practitioners without higher levels of formal education, while it privileges researchers. However, researchers also relying on abduction and retroduction need more than logical thinking, skills in statistical analysis or knowledge on qualitative methods. As Danermark et al. (2005, 80–81) highlight, abduction depends on creativity, fantasy and the ability to associate, while retroduction relies on the ability to abstract. In order to succeed with these forms of inference, more than formal education is required. In principle, the spatial, cultural and social context of research as well as psychological and social competences get important.

In a KA the urgently required creativity may be inspired by questions from outside the ordinary research community. The experience and knowledge of others can stimulate researchers to see something particular as something different, distinctive of abduction. In Unequal Diversity (Novy 2012), a research project within the KA Hauptschule trifft Hochschule, innovative methods like Augusto Boals Theatre of the Oppressed and a Futures Workshop were used to stimulate creativity. Pupils from Hauptschule, mainly attended by migrants and children from poor families, worked together with mainly upper-middle-class pupils from a Gymnasium, located only 70 m away, but had been totally separated until then. Innovative settings were helpful in facilitating non-verbal forms of communication and reduced the barrier for the participation of pupils from Hauptschule. It allowed researchers to observe how pupils from the grammar school perceive their way of living as ‘normal’ and natural. The relationships with pupils from Hauptschule were either based on exoticism or the adoption of a patronizing attitude. Pupils from Hauptschule, on the other hand, behaved and aimed at being ‘normal’ youngsters in Viennese multi-cultural society, aiming at becoming part of mainstream society. The usefulness of the cooperation was only questioned by participants from grammar school, while the participants from Hauptschule were eager to build bridges and intensify cooperation. The Futures Workshop, documented in a master’s thesis (Hoffelner 2011), dealt with the respective imaginaries of the poor and the migrants as well as the upper-middle-class pupils in redesigning a park, a green area of approximately 100 × 100 m. While the pupils from Hauptschule had a clear practical knowledge on the multiple use of densely populated public spaces for kids, youngster, boys, girls, elderly, dogs etc., pupils from grammar school planned an English garden, similar to gardens in their
neighbourhoods. Abductive reasoning on this and other experiences in the cooperation led to a creative re-interpretation of the often cited ‘resistance to integration’ attributed to migrant culture, even denouncing it as a parallel society. In our case, however, the poor and migrant pupils behaved and perceived themselves as conscious and pragmatic members of an increasingly diverse city, while the upper-middle-class pupils took their middle-class way of life and imagination as normal and universal. It even seemed as if it were them, who did not want to integrate, remaining separate and sticking to their ‘normal way of life’. The principal and most teachers from the grammar school officially stopped cooperating after the end of the project, while teachers and the principle from Hauptschule aimed at continuing the cooperation with interested teachers in the grammar school. Integration, it seems, is not primarily a problem of the excluded but of so-called mainstream middle-class society.

Advancing from this abduction, researchers proposed a retroduction to explain the widely observed decreasing social mobility: What if the refusal of integration by the middle-class results from an attempt to secure a comparative advantage in education and, subsequently, on the labour market? Uneven access in the school system might exist because it permits ‘opportunity hoarding’ of quality education of the middle class. Concentrating children from disadvantaged backgrounds, migrants and poor in schools with lower standards creates competitive advantages for others, the middle and upper classes. This educational segregation has become more important in the current political-economic setting characterized by increasing competition in the labour market.

In summary, it can be stated that practitioners can contribute to knowledge production by revealing the unconsciously incorporated semiotic moments in research by asking other kinds of questions. Researchers benefit from being questioned by others and from being forced to explain themselves using other means of expression than those typical in the scientific community. This raises awareness regarding power relations incorporated in apparently neutral rationalist discourses. Practitioners can help researchers by revealing these unconsciously incorporated semiotic moments and by reminding them of other potential referents, albeit by other means of expression, such as the two young people at the conference in Vienna 2009 did (see above). Inclinations of researchers to overemphasize theoretical knowledge can be counterbalanced by underlining the societal relevance of interests of the practitioners. Working together can enable both parties to acquire the knowledge produced.

Achieving societal relevance

As researchers, we have chosen to devote much effort to produce knowledge on the lack of social cohesion in cities, its causes and how to combat it. In this way, we want our research to become societally relevant. As a matter of course, an important precondition is a will to do so. Initiating KAs with the aim to become societally relevant in that sense can attract practitioners with a particularly appropriate potential for contributing to scientific excellence. This may include teachers from schools in socially excluded neighbourhoods or professionals working with homeless people. They all, either directly or indirectly, experience the effects of inequality. All of them must deal with these effects and do, therefore, bring a desire for change into the KA. This includes expectations for mutual knowledge production that may become a productive challenge for researchers.
Practitioners contribute to KAs with their experiences of actualized knowledge. Researchers produce knowledge as a potential. Actualization of knowledge requires its use. Once potential causes are actualized, something new emerges (Danermark et al. 2005, 60–65). Therefore, an event must not be reduced to its actualized potentials. An actual cause is something different than a potential cause because the actualization of that potential cause always happens in a specific context with its own properties (Stigendal 2018). Therefore, natural scientists like doing experiments in order to see what happens, if a certain potential is actualized. Social scientists cannot treat their objects in that way. For this reason, the collaboration with practitioners in KAs is so productive, as practitioners may know about the use of a certain knowledge in a specific context outside the scientific community. They have experience in the societal relevance of knowledge.

An involvement of practitioners under biased conditions, however, runs the risk of not actualizing their potentials. Forcing practitioners to express knowledge in a certain way impedes them from appropriating the knowledge produced in KAs. Furthermore, it makes it more difficult for a researcher to benefit from the practitioners’ experience and knowledge. Street workers in neighbourhoods associated with a lack of social cohesion might, for example, give little attention to theoretical brooding. They need incentives to participate in KAs. A practitioner might ask: ‘What can I bring back home to the community?’ Restless kids need to be taken care of. Schools have to be kept open despite vandalism, fires, shattered windows and burglary. Many of these practitioners probably ask themselves: ‘Are we doing the right thing?’ For some, the answer is clear. They know that they are not doing the right thing, but given the circumstances – austerity, unemployment, raising rents – they cannot do anything else. Cooperation with these practitioners on an equal footing can exert productive pressure on researchers and provide them with valuable sources of inspiration as well as a need to perceive the (positive and negative) potentials of political agency.

Several KAs have been set up with the restricted objective to gain societal relevance due to funding requirements. Creativity and ingenuity by researchers as well as practitioners have then been used, however, to combine societal relevance with the two other validity criteria of scientific excellence, the referent and reference criteria. One such project was ‘Young People – from Exclusion to Inclusion’, funded by the URBACT programme, involving practitioners and researchers from 12 European cities (Stigendal 2006). With the support of researchers, the project was set up for practitioners in order to learn from each other’s examples of good practice. However, the participating researchers could illustrate that the meaning of good practice depends on the definition of the problems that the practice is supposed to solve. This made it important to put the issue of the project into a comparative perspective that included research exploring the underlying potentials of labour markets, education systems and welfare regimes. Knowledge on such subjects, provided by the researchers, proved to be societally relevant for the practitioners, as researchers were able to point out the usefulness of spending time together on defining problems. The practitioners contributed context-specific knowledge, while the researchers provided the bigger picture. It also enabled researchers to get access to a wide range of data, contacts and experiences from the cities that proved highly beneficial for their research. At the same time, conducting research in a context with practitioners, who reminded them of societal relevance exerted constructive pressure on the researchers, not usual in academic research (Stigendal 2006).
A current example of how projects with an emphasis on societal relevance can provide opportunities for researchers is the educational platform for societal and health communicators in Sweden (Carlzén and Zdravkovic 2016) dealing with support for refugees. The platform is currently under development and will offer comprehensive training for the approximately 200 communicators across Sweden that will, according to the objectives, enable them ‘to acquire the knowledge required to contribute to the development of the newly arrived as knowledgeable, capable and democratic citizens with self-confidence and ability to make their own, wise choices’ (own translation from Information om Sverige 2018). The project is run by regional authorities on a national basis, co-funded by the European Social Fund (ESF) and supported by the national government in cooperation with five universities. In the specific project design, researchers were able to arouse the interest of public bodies and communicators to engage in research on the societal context characterized by multiple boundaries, inequalities and exclusionary dynamics. Many of the refugees that the communicators meet in their everyday work end up suffering deprivations regarding income, housing, work etc. The communicators learn a lot regarding these issues and also regarding the positive potentials of refugees, particularly because of their knowledge of language and culture. Furthermore, communicators experience how societal systems work and contribute to inequality. This makes them particularly apt as partners in a KA. It is intended to recruit those, on the basis of the above-mentioned training, who have proven to be interested and capable. The KA will be an opportunity to develop their professional skills as communicators. The researchers, in turn, will get access to a wide range of empirical referents, support from practice-oriented knowledge and constructive pressure to engage with societally relevant questions.

**Conclusion**

In this article, we have explained how transdisciplinary collaborations can be encouraged by critical realism. We call such collaborations of researchers and practitioners knowledge alliances, defined as equal partnerships, in which researchers and practitioners work together to produce knowledge, based on an attitude of respect, self-reflection and inquisitiveness. We have outlined how the merits of interdisciplinary collaborations can benefit from extending the partnerships between researchers from different disciplines to practitioners. In principle, critical realism favours such equal partnerships because of its rich conceptualization of potentials that are hardly recognized by social constructivism and empiricism. The knowledge of practitioners is appreciated on its own conditions that both social constructivism and empiricism exclude. Furthermore, the use of all four forms of inference makes critical realism intrinsically supportive of transdisciplinarity. Finally, we have pointed out how societal relevance should be regarded as an integral part of the excellent research.

Excellent research depends on what it explains about its referents (research objects), its conceptual and theoretical consistence as a reference and its societal relevance. The fact that practitioners can contribute to all these three aspects is a strong plea for transdisciplinary collaborations. Firstly, practitioners can contribute by identifying and providing access to referents, for example, by getting access to people, asking understandable questions and bridging cultural differences. Secondly, practitioners contribute by producing references, for instance, by encouraging researchers to see something particular as
something different in line with abduction and suggesting counterfactual ideas in line with retroduction. There is also a third way in which practitioners can contribute; they can bring the currently important societal issues into the research process and thereby place pressure on the knowledge production to become societally relevant.

We call this approach ‘potential-oriented’. Our deliberate choice of the term as a signifier reflects the shift in the main focus suggested by critical realism: from actual events to the potentials causing these events, alongside a sensitivity towards the ways that practitioners communicate, think and express themselves. The choice of the term is highly relevant. In contrast to our potential-oriented approach, evidence-based policymaking, due to its empiricist foundations, does not believe in the important distinction between referents and references. Therefore, we have called such an approach ‘problem-oriented’, since it lacks the ability to distinguish between the problem and its definition, and thus takes what seems to be the problem for granted.

We hope that we have paved the way for further work to elaborate a consistent research programme for transdisciplinary knowledge production. In this respect, methodological questions will be of decisive importance. We assume that there is huge potential in systematically using methodological insights from transdisciplinary research and link it to interdisciplinary research based on critical realism.

Notes

1. Our definition does not coincide with the one of Bhaskar, Danermark, and Price (2018, 124) who regard it as a specific phase in the achievement of interdisciplinarity. We prefer, however, to rely on other authors, like the ones quoted, as we need a concept for collaborations that goes beyond the interdisciplinary ones.

2. *Hauptschule* is a modern secondary school, a specific Austrian type of school for lower secondary education from the 5th to the 8th school year pupils. Effectively, in urban areas it gathers children from poor, migrant and refugee backgrounds. Due to its negative connotation, its name has changed several times. Today, *Neue Mittelschulen* (New Secondary Schools/NMS) still gather children from the margins of society, while middle-class kids go to grammar school, the *(Real)Gymnasium*.

3. This unwillingness to accept the integration of newcomers has increased since 2015. However, as a long-term effect of these collaborations, pupils from *Hauptschule* and grammar school, located by the same park, intend to realise a joint urban gardening project in 2019.

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