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### Highlights

We present a heuristic designed to reflect on and improve the transdisciplinary research capacity of teams.

The heuristic is based on the metaphor of performance and aims to create awareness of routine behaviours that potentially inhibit transdisciplinary teamwork.

The heuristic has been inspired by Goffman's approach to performance, and can be used for self-reflection in masterclasses, or for teambuilding in preparation for collaborative research projects.

Using the heuristic has demonstrated that imagining research as performance can create space for new ways of doing and thinking about transdisciplinarity.

## **Prompting Transdisciplinary Research: Promising Futures for Using the Performance Metaphor in Research**

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## Prompting Transdisciplinary Research: Promising Futures for Using the Performance Metaphor in Research

### Abstract

Transdisciplinary research is increasingly recognised as important for investigating and addressing ‘wicked’ problems such as climate change, food insecurity and poverty, but is far from commonplace. There are structural impediments to transdisciplinarity such as university structures, publication requirements and funding preferences that perpetuate disciplinary differences and researchers often lack transdisciplinary experience and expertise. In this paper we present a heuristic that aims to encourage researchers to think about their current research as performance and then imagine different performances, with the view to encouraging reflection and creativity about the transdisciplinary potential and dilemmas. The heuristic is inspired by the metaphor of performance that Erving Goffman uses to understand everyday, face-to-face interactions. The heuristic includes scaffolding for imagining research as performance through a transdisciplinary lens, a suggested process for using the tool, and examples based on the every day research projects. The paper describes the application of the heuristic in a graduate Masterclass, reflecting on whether it does indeed ‘prompt’ transdisciplinary research. Limitations and lessons learned for further refinement of the heuristic are also included. The authors conclude that the heuristic has a range of uses including for self-reflection, and as a practical learning tool that can also be used at the start of integrative research projects.

**Keywords:** transdisciplinarity, performance, performativity, role of researcher, reflection, heuristic

## 1. Introduction

Transdisciplinary research is an increasingly mature approach that a broadening range of journals and disciplines consider relevant. Scholars in this field are investigating the characteristics of transdisciplinarity (Wickson et al., 2006; Mobjork, 2010; Lang et al., 2012), developing 'tools' for evaluating transdisciplinary research (Pohl, 2005; Carew and Wickson, 2010) and reflecting on experiences of transdisciplinary researchers (Ramadier, 2004; Pohl, 2005). At the same time, they are advocating the importance of transdisciplinary research to investigate and address 'wicked' problems such as climate change, food security and poverty (Lawrence and Després, 2004; Hadorn et al., 2006). These problems are complex, have multiple problem definitions, lack clear solutions and are trans-sectoral, requiring collaborative approaches by a wide range of public and private actors (Rittel and Webber, 1973; Lawrence and Després, 2004). However, in spite of all this activity, embedding transdisciplinary research firmly into the academic world continues to be challenging.

We can find in the literature on transdisciplinary research a wide range of definitions. Pohl (2005) brings together various elements that are often considered as key to transdisciplinarity by defining it as research that "takes into account the complexity of an issue (...), addresses both science's and society's diverse perceptions of an issue (...), sets aside the idealised context of science in order to produce practically relevant knowledge (...), and deals with the issues and possible improvements of the status quo that are involved in balancing the diverse interests and inputs of individual stakeholders and disciplines" (pp. 1160-1161). In practice, transdisciplinary research involves a wider range of stakeholders than just academics (including community interest groups, industry and government), requires 'close and continuing collaboration' during every phase of the research and, it is often 'action-oriented' (Lawrence and Després, 2004). These traits are in contrast to multidisciplinary or interdisciplinary research, in which each discipline works in a 'self-contained manner' (Lawrence and Després, 2004).

Why is transdisciplinary research still so challenging? Because, according to both

Klein (2004) and Horlick-Jones and Sime (2004), there are conceptual, as well as institutional and social barriers. These barriers exist in multidisciplinary and interdisciplinary research, but are more salient in transdisciplinary research, where 'problem-oriented issues of social, technical and/or policy relevance are involved' (Horlick-Jones and Sime, 2004 pp. 522). Thus, impediments to transdisciplinarity have gained critical attention, such as the way universities are compartmentalised (Lawrence and Després, 2004; Petts et al., 2008), divergent language and culture of different disciplines (Petts et al., 2008), publication culture (Kueffer et al., 2007), funding preferences (Petts et al., 2008) and reward mechanisms (Evely et al., 2010). However these impediments do not leave researchers and research leaders powerless to change the situation.

The Futures and other journals demonstrate that there is a growing body of literature about a diverse range of tools and ways of 'cultivating transdisciplinary capacity' (Klein, 2004; Klein, 2008). This includes, but is by no means limited to, adaptable heuristics to help researchers visualise and discuss what it means to do transdisciplinary research (Carew and Wickson, 2010; Huutoniemi and Tapio, 2014), evaluation frameworks that provide researchers with a guide to critically reflect on their attempts to enhance transdisciplinarity in their work (Author et al., 2014), 'interdisciplinary encounters' to provide researchers with exposure to different disciplinary perspectives and an opportunity to create research networks across disciplines (Bridle et al., 2014), problem based learning via case studies and exercises that simulate the co-production of knowledge (Stauffacher et al., 2006; Balsiger, 2014), professional development programs that support researchers to improve their 'transdisciplinary work' (de Nooy-van Tol, 2003) and mentoring and masterclasses for researchers on how to explicitly reflect on their research practice (Lyll and Meagher, 2012).

However, while a diverse range of approaches exists they often comprise of quite general teaching tools (mentoring, group work, case studies, problem-based learning) and emphasise the development of specific skills needed for transdisciplinary research (communication skills, systems thinking). The authors argue that creativity also plays an important role in enabling researchers to think

outside their disciplinary box. Our experience suggested that researchers find it difficult to imagine what it might mean for them and their research environment to explore transdisciplinary opportunities, especially opportunities for collaboration with people other than their peers in a community of researchers. To this end, our objective is to further the development of heuristics, using a more creative and unconventional approach. The heuristic presented might stand alone or complement other tools of observation and learning aiming to understand the world from the viewpoints of different observers. It can be executed in a relatively short amount of time as compared with learning by doing in a real-project situation; provides users of the heuristic with a common language for talking about their research; encourages the researchers to step out of normal routines; and, aims to deliver an embodied experience (cf. Hukkinen and Huutoniemi, 2014).

Finding inspiration in theories of performance (Section 2), in particular the seminal work of Erving Goffman about dramaturgical analysis of social interaction (Goffman, 1959; Manning, 1992), we developed a heuristic that forms the basis of thinking about research as performance (Section 3). To develop the heuristic further the authors 'transformed' the researchers descriptions of their practice into concise portraits using the language of performance, to include as examples of applying the heuristic. These descriptions were derived from interviews with 10 researchers from different disciplinary backgrounds, all of them working on environmental problems that cannot easily be solved from within the boundaries of a single discipline and most of them relatively experienced (as in mid- to late career). The transcripts of the interviews provided us with rich accounts of the researchers' practice, mostly in relation to one of their recent research projects. We then tested the performance metaphor in a research- and design oriented Masterclass of thirty-seven students with different disciplinary backgrounds, and asked the students to reflect on their experiences in doing so (Section 4). This exercise enabled us to reflect on the utility of the heuristic and whether it helped researchers think differently about their roles and interactions with others in the research process. We discuss the potential uses of the scaffolding in the final section, reflecting on the usefulness of theatrical concepts for learning about



transdisciplinarity and on ways to build these practices more structurally into research processes.

## 2. Performativity and the performance imagery

Scholars from different analytical traditions have addressed performance and performativity in very different, and sometimes contradictory ways (Gregson and Rose, 2000; Thrift, 2003). It is beyond the scope of this paper to go into the details of these traditions, but it is important to note here that performance has often been associated with a single event, a one-off occasion that has no further consequence, whereas performativity stretches beyond the event, for example by way of specific use of language that becomes normalised, disciplining people to prioritise certain courses of action and not others. Performance and performativity are intrinsically connected (Gregson and Rose, 2000). For example, and in spite of ubiquitous participation-rhetoric, in the ways that researchers perform communication about their projects, a common normalised expression like 'knowledge transfer' implies a role for the researcher as the 'holder' of knowledge, and a role for publics as receivers of knowledge. Also, in this view of knowledge as something that can be transferred, knowledge is sitting out there, waiting to be discovered and distributed, rather than being relational, and evolving in interaction between different actors. The practice of knowledge transfer in this example is a single event and can be seen as performance. However, the repetition of the use of this vocabulary turns it into routine and so it is also performative in the way it establishes a specific detached view of what an academic practitioner is expected to do in terms of producing knowledge.

Explicitly imagining and presenting research as performance, and acting in accordance with such image, may help researchers to become aware of their roles and facilitate stepping away from the safety of everyday practices and embracing less familiar roles and practices. Imagining research as performance provides a rather optimistic twist to Goffman's ideas that are focusing on actors' calculative behaviour in face-to-face interactions. Our point is that by performing the 'routine' and the alternative role in workshop settings, actors are more likely to get accustomed, even if only in an initially superficial way, to a new practice. Thus,

rather than putting emphasis on rules as constraints, rules become the topic of explicit consideration and exploration for alternative behaviour. This might eventually contribute to transdisciplinarity becoming more permanent and institutionalised. Doing the performance regularly might make researchers feel more comfortable with different ways and intensities of collaboration in research; they might start to identify with the new roles.

In this paper we will use performance, and theatre in particular, as a metaphor. Although we are using the theatre imagery, in the end, research (as a specific form of social interaction) is not a theatre production. We use the metaphor to reflect on the social interactions that are involved with doing research. This has not often been done in the social sciences (Goffman, 1959; Baerenholdt et al., 2010). Importantly, we consider the metaphor of theatre instrumental for drawing attention to both the structural impediments to doing transdisciplinary research and the potential of action to reach beyond these constraints. On a stage, a person can re-enact routines, or act differently from how he/she normally would. By stepping away from normal routines, and into a created someone else, he/she might see: a) new opportunities for engaging with others such as co-performers or the audience; b) new ways to confront impediments to his/her new behaviour; or, c) alternative ways of using costumes, props or other elements of the setting to bring about a desired performance. Yet the actor is not totally free, as he/she may be confined by structural elements such as the stage itself, routines that the actor and the audience have become accustomed to and which they have come to prefer or identify with 'good theatre', etcetera. The potential for the drawing of parallels is endless.

Erving Goffman is one of the most well known sociologists who has used theatrical concepts and performance. In particular, he used the metaphor of performance to theorise about everyday, mundane communications. This is in contrast with most sociologists of his time, who emphasized the role of general social structures. By means of the analogy of theatrical performance, Goffman illustrated how daily interactions between people have become 'normalised', and are strongly influenced by coding and strategies (Vosu, 2010). He defines performance as "all

the activity of a given participant on a given occasion which serves to influence in any way any of the other participants” (Goffman, 1959 pp. 15). We can ask: what roles do the performers want to play, and how much of that role is pre-scripted by what is socially expected from them? How much room is there to manoeuvre? What is needed to enlarge this room to manoeuvre? For example, in terms of the setting, an elevated stage in a grand theatre does not encourage participation by an ‘audience’ as much as a café-style open space where the distinction between participants is much less articulated. Or, in terms of the expectations of the behaviours of the audience, an audience having paid tickets to listen passively to an oration will not expect to have to be vocal and creative. Because social interactions among diverse groups are a cornerstone of transdisciplinary research, Goffman’s thinking about performance-as-metaphor can be made relevant for advancing towards transdisciplinarity by using it to think about academic practices. The ‘doing’ and the reflections can be distinguished by using front stage and back stage, respectively: when front stage the actors play their roles, when back stage they reflect, evaluate, formulate intentions for their next performance.

The notion of theatre, and theatrical concepts are a tool to reflect on the present situation, and to imagine different possibilities. A researcher may place him/herself in the shoes of the main performer, and ask, for example, how they would ‘normally’ use props or other features of the stage to engage with others. And crucially, they may go on to imagine themselves in rather different roles, and ask what kind of stage would be required to perform these roles. Would such a different role also require a different behaviour from the audience? Would there be ways to encourage that behaviour? What does the new role mean for how the performer has to present her- or himself? How much can the audience influence the play? Would there be room for an even greater input? Would it help, to change the costume or the setting?

Learning about transdisciplinarity may benefit from using theatrical concepts particularly if some level of creativity is encouraged to bring different forms of theatre into the analogy. As with the theatre imagery, which is very open ended in the types, settings, quality and style of performance there are many options, mixes

of existing forms of theatre may be chosen, or even new ones. Within the format of a particular (imagined) form of theatre, the researchers may adopt particular roles (e.g. main performer, script writer, director or producer). How can using the theatre imagery become more practicable for the academic practitioner? This is the topic to which we will now turn.

### 3. Scaffolding for imagining research as performance

There is no right way of thinking about research as performance because as we have already pointed out the options are endless – research can be envisioned as highly scripted with relative predictable behaviours in isolated settings (think of a lab), or, at the other end of the continuum, as a form of improvised theatre (perhaps even on the street?) with many actors and demands on all participants to be flexible in their responses to others, or to changes in the setting (think of Action Research). However, as with all analogies, the theatre performance metaphor can provide scaffolding for initiating creativity, to encourage imagination and reflections as an iterative process. There are two simplifications that we should always keep in mind while applying these ideas to our own work. First, metaphoric comparisons are always simplifications: what the metaphor is referring to is always more complex than the metaphor or how we use it. Second, we drew inspiration from Goffman's elements of performance, but have created our own structure by selecting elements that we find particularly useful for our purposes to think about the possibilities of doing transdisciplinary research (the elements in section 3.1).

The scaffolding we have developed comprises two parts. Part one outlines the elements of theatre as a starting point for thinking about research as performance. These elements are intended to 'unpack' the performance metaphor to help us think about a project that we are doing at the moment and of the different roles that we play in these projects depending on the setting (context) that we find ourselves in. These elements are also meant to encourage our imaginations of what it might be like if we, to an extent, let go of these patterns of interaction that we know all too well, and transformed them into interactions that we think are necessary or desirable when conducting more transdisciplinary types of research.

Part two presents 'imaginings' of everyday research projects as performance. The authors developed these by imagining the researchers' accounts of their research practice, recorded in the interviews with them, as performance. These are meant to provide users of the heuristic/scaffolding with examples of what a research performance might look like and how this imagery could be interpreted for learning about transdisciplinarity.

Suggested steps for using the scaffolding are: 1) discussing the elements of performance in order to engage with the metaphor and develop a shared language; 2) imagining a current research project as a performance; and, 3) reflecting on these performances for learning about transdisciplinarity. Reflections and learning on transdisciplinarity can be done in groups such as the masterclasses proposed by Lyall and Meagher (2012), and/or on an individual basis. The scaffolding that we provide can be used in both ways. In groups, the role of a facilitator is important as he/she can foster creativity and help researchers identify revealing elements of their performance to stimulate discussion about transdisciplinarity. The facilitators may also need to encourage researchers to challenge their interpretations of their performances as researchers may be inclined to defend their performance or have difficulties imagining a transdisciplinary performance. Alternating between front- and back stage can be a helpful way to reflect more freely, and critically, on academic practice as this critical attitude is expected from the participants back stage.

### 3.1. The elements of performance

In this section we distinguish between three elements of performance: 1) roles and interaction between the cast and crew; 2) role of the audience; 3) the stage, including what happens front stage and back stage and the setting in which the performance takes place. As discussed previously, these three are not the only elements of theatre; they are intended to provide a starting point for imagining research as performance.

### 3.1.1. Roles and interaction between the cast and crew

A performance is the product of the collective efforts of the cast and crew working together to entertain, amuse, provoke. Each individual has a specific role and certain obligation to the rest of the cast/crew to perform their role. However, how they interact with each other and the extent to which they are able to shape the performance can vary greatly. 'The Mousetrap' is the longest running stage show in London; after 60 years do the cast/crew operate as cogs in the machinery of that performance, routinely fulfilling their role without question to deliver the original script to an expecting audience? Perhaps, or maybe the latest director has enabled the cast and crew to inject new ideas, respond to new contexts even though it isn't part of the script. Alternatively, cast and crew members, tired of the lack of interpretive freedom and improvisation, might try out for a new kind of performance. In this new performance cast and crews roles are more fluid and forms of teamwork are encouraged that enable people to be creative, rather than always acting in correspondence with a prescribed view of the show. The performance unfolds as it is rehearsed and performed. No two performances are the same as the cast and crew co-write the performance. Here there is no such thing as 'true' representation.

Teamwork is a core element of transdisciplinary research, required to foster collaborative ways of working and encourage the participation of non-professionals. Similarly, transdisciplinary research is likely to be highly improvised as, for example, new dimensions of the research problem become apparent or new actors and/or audiences present themselves as having a stake in the research.

### 3.1.2. Audience participation

A risk of the theatre imagery might be its likely intuitive association with an active cast and crew, and a passive audience that has no influence on the performance. However modern forms of play, such as theatresports, actively draw in whoever wants to participate from the audience, to the extent that they become actors as well and co-develop the script. In transdisciplinary research, conscious decisions

need to be made about who may be a passive audience and who are expected to co-develop a script and partake in the play.

Participating in the play may not always be a natural thing to do, as traditionally the audience are passive observers; in a modern day performance of Shakespeare the audience may applaud (or throw tomatoes), but they are unlikely to contribute to the performance or script. In more experimental theatre such as improvised theatre the audience can take on a range of roles. The audience might provide sub-plots and themes that contribute to the storyline or volunteer and participate in the performance. This interactive and participatory relationship with the audience creates further opportunities for co-production and co-performance.

A researcher can similarly engage the audience(s) of their research in different ways. For example, research can be delivered (performed) for local government, or local government staff can appear in a supporting role and/or contribute to the script development. Interaction between how researchers present themselves and what the audience expects will also play a factor in determining to what extent the audience(s) are engaged in the performance.

### 3.1.3. Stage(s) and settings

Research stages/settings range from conferences and peer-reviewed journals to the forest, farmer's paddock, office, community forums, policy-meetings and the pub. Each setting provides opportunities and barriers to transdisciplinary research. A performance that takes place in the pub (a form of street theatre) could provide an opportunity to engage with a diverse audience, but could pose a challenge, as it may not be possible to control who/how people participate and it may be difficult to find a quiet place 'back stage' to reflect on the process. Whereas a conference presentation (delivered from a podium) is likely to limit the audience(s) reached and restrict participation.

Thinking about the stage and setting provides us with a metaphor for thinking about where research takes place, and how this might affect a researcher's ability to conduct transdisciplinary research and overcome institutional impediments, to

engage with different audiences, interact with diverse participants and take time to reflect on the research process. To this end, transdisciplinary researchers might require new skills such as an ability to move between different settings and discern which setting is most appropriate to engage different audiences. The distinction between front stage and back stage is useful to articulate as there is always an opportunity to step away from the visibility of a public and reflect on what has happened on stage. Play on the front stage may be more or less formal depending on the level of improvisation and preparedness, but it is always in the face of an audience. Although use of social media has sometimes blurred the distinction, back stage is mostly away from the audience. If used cautiously, it may provide for a safe haven where things can be said off the record.

### 3.2. Imaginations of everyday research projects as performance

The imaginations presented below (Boxes 1 and 2) interpret the research described in the interviews as performance using the scaffolding outlined. The researchers interviewed all study so-called 'wicked' problems and their research to some extent aims to inform policy and/or practice. The imaginations presented are composites of these experiences that were written by the authors to highlight the utility of the performance metaphor. The imaginations are intentionally playful/imaginative to demonstrate the possibility of diverse performances and to indicate that there are no good or bad performances. To help the reader, for the first imagination (Box 1), we have placed between brackets the components of a research project to which the imaginations refer. Reflections on each performance are provided to identify potential opportunities for learning about transdisciplinary research. The questions that guided the reflection are derived from the definition of transdisciplinarity provided in the introduction and include the extent to which the research/performance: takes into account the complexity of the problematic; addresses both science's and society's diverse perceptions of an issue; sets aside the idealised context of science in order to produce practically relevant knowledge; involves balancing the diverse interests and inputs of individual stakeholders and disciplines; involves non-academics; and, cuts across disciplines. Reflecting on the extent to which the performances demonstrate



transdisciplinarity may help others reflect on the constraints or potential for transdisciplinarity in their own research.

### 3.2.1. Performances about models

The performances presented in Box 1 are derived from the research experiences of two modelers (Morgan and Jack). Models are a way of representing a 'system' physically, conceptually or through the use of computers. Modeling is commonplace in research on complex problems such as climate change as they can help researchers understand what is contributing to a changing climate and predict changes and impacts under different scenarios. They can also be used as practical tools for making decisions about mitigation and adaptation strategies. Morgan is developing a model that will be used by industry as a decision support tool. The model that Jack is developing will be used to understand and predict changes.

Morgan's account illustrates the performance of an independent researcher. The audience for whom the model is being developed (industry) is passive, they do not co-write, co-produce or co-perform, instead they are expected to receive the model once it is complete. Morgan's justification for the passive role of his audience is the complex nature of his model as well as an idealised view of science and scientific process (represented by being focused on the critics (peers) reviews). Jack's approach is very different; although the scientific community (attending the formal performances that take the shape of presentations at science conferences and publications in academic journals) is the main audience of Jack's research, it is also important to Jack to involve the public to check that the model is practically relevant. The more collaborative approach provides opportunities for co-writing and co-producing the performance and enables Jack to take into consideration the diverse perceptions of different audiences including non-academics to develop the model.

Morgan and Jack's performances contrast a more monodisciplinary approach to developing a model with elements of transdisciplinarity. In a masterclass, participants might reflect on these two performances and conclude that Morgan's

approach is justified. Certainly not all research needs to be collaborative. However, a reflective discussion may spark thinking about the opportunities for transdisciplinarity. For example, it is possible that by not engaging with industry Morgan's model will lack practical relevance and that efforts to improve its utility once the model and research project are complete (such as providing industry with an explanatory book) will do little to change that. The involvement of industry throughout the project could lead to valuable insights about the utility, relevance and quality of the model. On the other hand, Jack's performance could stimulate a discussion about who to involve in the discussion and how; the potential challenges to co-production/performance; and, what to do if conflict arises.

## Box 1: The modelers' performances

The model – a solo performance  
 Written by the researcher  
 Directed, produced and performed by the researcher  
 Audience participation discouraged

Morgan is a solo-performer producing and writing a show (developing a model) titled 'the model' (the title isn't very catchy, but he is confident that it will be a high quality production). It is a new type of performance and has a highly technical plot and for these reasons he works in isolation as the scriptwriter, producer, director and performer (e.g. developer of the research questions, research plan, model design and functionality). A technical team (of disciplinary experts) occasionally provides him with parts for the model; because the model takes centre stage it is important that it is well designed. The show opens to rave reviews from the critics (academic peers), but audience feedback (industry and government users of the model) suggests the plot was too mysterious and they still are not entirely sure what the model represents or how to use it. Morgan is thrilled by the reaction from the critics, he hopes this means that he is in the running for an Oscar nomination, but it is also important to him that the audience can use the model. To address this, in subsequent shows he provides audience members with a program (user guide) that outlines the plot and describes the mysterious, symbolic and technical aspects of the model.

The model – a collaborative production  
 Written by the researcher in collaboration with cast, crew and audience  
 Directed by the researcher in collaboration with the cast and crew  
 Audience participation encouraged

Jack is also producing a play called 'the model', but this is a collaborative production; Jack is the director, but he takes a facilitative rather than authoritative approach and encourages all cast and crew to contribute their ideas. The performance will be given in a number of formal settings; several smaller performances will also be given in informal settings so that it will reach a wider audience. The production itself is a kind of improvised theatre, the audience and performers are encouraged to try on the model and use this to prompt their engagement with the script. In this way the model and script are continually revised. The critic's reviews are important, but audience feedback and participation are considered equally important for improving the utility and relevance of the model and the quality of the performance. At the same time, Jack hopes that by participating in the production the audience members will reflect on the plot and consider the relevance of the model to their own lives. Although Jack is mostly happy with this performance he does sometimes reflect that encouraging participation has its challenges. In this latest performance one participant is quite authoritative in her ideas about what should come out of the model and Jack is afraid that other participants are being persuaded by her opinions without question. If only he had never invited everyone to participate in the play, he sighs. The budget for the play was small and time for rehearsal limited – now he is facing a big over-expenditure and the final delivery of the play may have to be postponed!

### 3.2.2. New policy performances

Box 2 presents the imaginations of two researchers (Ben and Helen) who aim to reform public policy. Ben's research focuses on building up the evidence base around a particular practice and convincing people that it should be incorporated into current policy. He is committed to a single policy response and focuses on convincing his audience(s) that they should respond to his recommendation. Helen's research is focused on scrutinising a current policy that she is highly critical of in order to make suggestions for improvement. To develop suggestions she explores the issue from multiple perspectives with people involved in the implementation of the policy and/or impacted by the policy.

Although Ben and Helen have similar goals (to change policy and practice), they use very different strategies. Ben uses communication and dissemination of his research findings to promote change, whereas Helen is focused on working with people to understand the multiple dimensions of the 'problem' and to influence their thinking/understanding. A reflection on these different approaches could lead to a discussion about: the level of commitment policy-makers and people influenced by the policy are likely to have if they have a passive versus more active role in the reform; the potential for new insights and understanding of the issue/response by involving diverse audiences taking into account their perceptions of an issue; and, the challenges of considering/reconciling different perspectives.

## Box 2: Policy performances

Let me convince you  
 Written, directed and produced by the researcher  
 Creative input provided by cast and crew  
 Includes scenes which require audience members to volunteer

Ben is producing and directing his own play designed to educate audiences and convince them of the need to create new policy based on his recommendations. To achieve this, he has written a compelling script, recruited well-regarded performers and created what he hopes will be an engaging and convincing show. The show is delivered to a range of audiences either in a position to lobby for change or influence policy directly.

Ben is open to feedback and input from cast and crew, especially relating to innovative ways to educate and convince the audience of the performances key message(s). He is also open to performing tailored shows for specific groups, particularly when there is a possibility that this will encourage action or add weight to his recommendations. Ben is less concerned with involving general audience members in the performance. There are some scenes written into the play that call for volunteers from the audience, but the main purpose of this is to augment the cast numbers and enhance the show. Overall, Ben is certain that he has the script right and if he produces a stellar performance it will lead to policy reform.

Can we persuade you  
 Written, directed and produced by the researcher in collaboration with cast, crew and selected audience members

Helen is participating in a production that aims to encourage reform (of existing and controversial policy). This production is being developed collaboratively by a team of writers, directors, producers and performers who are committed to exploring the subject matter from different perspectives in the hope that their script will be compelling. The production showcases these different perspectives via a series of interwoven short stories.

The level of audience participation varies for each performance depending on the audience member's level of experience with the story line. Audience members with direct experience are actively engaged in the performance and are provided with opportunities to contribute their own short stories. Audience members with little direct experience take on a more passive role. The production team hopes that the performance might enlighten these audience members. A positive audience reaction is also important, as they are likely to influence the likelihood of reform.

This section has illustrated how different types of research practice can be interpreted in terms of the performance metaphor. In this section, we have done this on the basis of interviews with researchers of so-called ‘wicked’ problems. But the exercise, as demonstrated in the next section, can also be done in teams or by individuals, facilitated by someone who is familiar with elements of the scaffolding and with key characteristics of transdisciplinary research.

#### 4. Using the Performance Metaphor in a masterclass

An “Atelier” in March-June 2014 in the Netherlands, facilitated by one of the authors, provided an opportunity to trial using the performance metaphor. In this section we describe the assignment that was derived from the scaffolding for imagining research as performance. Analysis of student researchers’ reflections into this activity provide us with insight into whether the activity prompted reflection about aspects such as the researchers existing roles, exploration of new roles and thinking about different ways of collaborating with others. Finally, we present lessons learned for further development and application of the heuristic.

##### 4.1. The assignment

The Atelier is a full-time intensive two-month course for Masters of Science students in their final year of course work. The class is made up of an international group of students with diverse disciplinary backgrounds (mainly landscape architecture, land use planning, social-spatial analysis), and throughout two-thirds of the Atelier they work in teams.

The Atelier has a real-life commissioner who presents a problem to the students that they have to explore to fully understand and then develop ideas as to how to address the problem. In the 2014 Atelier they were given the task of designing a climate-friendly network of green spaces connecting the Utrecht city centre with its surrounding countryside. As part of the task we expected using the performance metaphor to help facilitate a process in which students reflected on

possible roles, both in terms of their discipline and in terms of their position as researchers and planners/designers in the process. In addition, multi-annual experience of the Atelier has shown that the teamwork is often difficult. The performance metaphor also provided an opportunity for students to reflect on their social interactions and collaboration with 'others' in the research.

We called the assignment derived from the heuristic the 'front-stage – back-stage activity'. Front-stage, the students were given a short amount of time to write a script and then perform it to the class. Back-stage the student reflected on the performances as a group and then as individuals in a reflection paper. Observations made during the activity and these reflection papers provided the basis for our analysis of whether the approach is 'fit for purpose'.

#### 4.2. Reflecting on the performance and application of the heuristic

In this paper we have set out that researchers engaged in a structured activity of imagining their research as performance will be prompted to reflect on their approach to research and consider key elements of transdisciplinary research. This reflection may lead to a heightened awareness of existing roles, exploration of new roles and thinking about different ways of collaborating with others. For example, a researcher might invite a wide range of stakeholders to help develop the research questions, incorporate in the research plan how lessons learned throughout the research project can be a topic of continuous reflection and dialogue or acknowledge in the research plan that there are different perspectives on the 'real-world' problem that is the topic of the research. Our analysis of thirty-seven personal reflections from the assignment enabled us to determine whether the performance metaphor does indeed serve such purposes. The responses demonstrated that for some the assignment did little to encourage reflection about their roles as researchers whereas for others the assignment led to new insights regarding:

- Taking into account 'science's and society's diverse perceptions of an issue' and what the diversity of perceptions would involve. A student reflected that imagining other roles could help "you get a better understanding [of] what the

interests of all the different stakeholders are” (012). Other students reflected on what the acknowledgement of different insights would mean personally for them in terms of their attitude and approach, for example it would involve “trusting their [the other stakeholders] abilities and changing my communication and expectations according to this” (09) and thinking about research as not being for research’s sake “I as a researcher have to listen very carefully to people and think how I can be a good researcher for their sake” (018). For one student, they felt that this responsive attitude would require preparation and planning “to ask the right questions”, “not put words in their mouths”, choose an appropriate setting (stage) “the street” and make use of appropriate props such as “a map” to guide the discussion (021).

- Challenges involved in balancing the inputs of diverse stakeholder groups. One student felt that there stills needs to be an “expert’s voice to guide other participants” (04) whereas for another they thought this would be difficult because “I am not used to this” (018).
- Different kinds of knowledge and self-awareness of the value of the knowledge of non-academics to produce practically relevant knowledge. As reflected by one student “in my opinion I am the expert and I know a lot more about the topic than the mob knows about it. But when I reflect on this, I know that the mob has a lot of knowledge: I do not have local knowledge” (018).

One student also reflected that the performance metaphor provided a place to practice interactions in the real world and in doing so “it can be more easy to spot this kind of “failures” in the process” (012).

The observations of the students varied significantly which is no surprise in view of the many dimensions of transdisciplinary research. Nevertheless, the reflections highlight that the heuristic encouraged researchers to reflect on the transdisciplinary potential and dilemmas. To improve the utility of the heuristic, our own reflection on the assignment and its impact revealed three main



limitations of the activity and identified lessons learned for the further development and application of the heuristic to address these.

Firstly, the creative approach engaged the minds of the students and encouraged teamwork. However, having challenged the students to be creative, some of the performances turned out to be so creative that there was hardly a link to the task of formulating a vision for a network of green spaces, and for others, being so focused on the performance was to the detriment of reflecting on the performance. We reflected that future application of the heuristic would benefit from more time spent setting the broader context and goals of the assignment, particularly the insights it should give in the meaning of interdisciplinary and transdisciplinary teamwork for the task at hand.

Second, students were given considerable freedom regarding the format of their individual reflections. While some people had no difficulty with the reflection others needed more guidance. A second stage of a collaborative, structured reflection by means of the list of questions drafted for the reflections on the performances of the imaginative 'Helen, Ben, Jack and Morgan' in the above (Section 3.2), would have guided the students through the reflections. Having a reading session about this paper in advance of the exercise would enable the facilitator to highlight these questions so that they can become a central point of attention. Detailed reports, or recordings on film of the performances to facilitate discussions in the groups, and a larger role of the expert/facilitators in the reflections after reviewing the reflection papers, can also serve to overcome this.

Lastly, it was apparent that the activity was constrained by the student researchers not having a clear sense of the roles they play as researchers. This lack of experience made it difficult for some of them to reflect on their role. A panel discussion with experienced researchers in the different disciplines, as an additional activity in the Masterclass, could assist in providing such background.

## 5. Discussion and conclusion

The twin concepts of performance and performativity have played pivotal roles in theoretical development in sociology and philosophy, in particular. The use of these concepts and their elaborations in reflections on the lives of academic practitioners, and particularly those working in contexts where transdisciplinary teamwork is an aspiration, has seen far less attention (with exceptions, see Baerenholdt et al., 2010).

In this paper we have presented and trialled scaffolding for enhancing the practicability of the performance metaphor for the development of transdisciplinary research. There are, oftentimes, a range of structural impediments that researchers have to negotiate before being able to make steps towards collaboration across disciplines and between science and the public. These impediments may prevent them from playing different roles than the ones they have grown accustomed to, and that their audiences expect from them. Thinking in terms of performance and actually playing a different role in a staged setting simultaneously or prior to the new type of interactions, can facilitate the transformation towards a broader collaboration. By 'living' the new role, almost as if the new situations already existed, the researcher can experience what it is, reflect on this and grow accustomed to its opportunities and pitfalls, potentially with other researchers. Beyond the event of the performance, bringing into practice the performance metaphor for the development of transdisciplinary teamwork changes the language of academic practice, meaning that it is performative. A key question is whether imaginary work by means of the performance metaphor, for instance in a masterclass, will actually break down the hurdles to transdisciplinary research that history has proven to be so persistent.

Our trial of the heuristic found that there are practical and psychological limitations of the scaffolding, for example, for some it may not provide users with sufficient support to imagine any other reality, there may be limitations embedded in the performance metaphor itself or the task of 'imagining' may be too abstract for participants. However, our own experience in developing the heuristic and analysis of its use is that performance is a common metaphor that people can more readily relate to than transdisciplinary definitions/theory, and that it fosters

creativity and playfulness. These things combined encourage reflection and ignite new perspectives regarding transdisciplinary approaches. For the more reluctant participant a skilled facilitator with understanding of the scaffolding and transdisciplinary research can guide the process, and providing more structure to the activity was a key finding for further improving the heuristic. For example, the facilitator may challenge the participants to step into each other's shoes. By doing this, empathy is encouraged, and they actually experience what it is to play a different role. The researchers learn to recognise the obstacles in their environments that need to be overcome, and they may even start to identify with a new role. This can create space for new ways of doing and thinking about transdisciplinarity.

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