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Fraaije, A.; van der Meij, Marjoleine G.; Vermeeren, A.P.O.S.; Kupper, Frank; Broerse, Jacqueline E.W.

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Creating room for citizen perspectives in 'smart city' Amsterdam through interactive theatre

Aafke Fraaije[1,*], Marjoleine van der Meij[1], Arnold Vermeeren[2], Frank Kupper[1] and Jacqueline Broerse[1]

[1]Athena Institute, Faculty of Science, Vrije Universiteit Amsterdam, the Netherlands
[2]Museum Futures Lab, Industrial Design Engineering, Delft University of Technology, the Netherlands
*Correspondence: a.fraaije@tudelft.nl

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Abstract

The 'smart city' vision is popular, but it lacks citizen perspectives. The aim of this study was to gain insight into whether and how art-based citizen engagement can create more room for citizen perspectives in smart cities by developing and testing an art-based citizen engagement project in Amsterdam, the Netherlands. To that end, a combination of interactive theatre, interaction design and social research methods was used to bring together diverse publics and innovation professionals for joint exploration of increased dataveillance in cities. The events were studied through observations, and through interviews with participants and organisers. Data analysis was guided by the outcomes, processes and challenges of the responsible innovation dimensions: inclusion, reflexivity, anticipation and responsiveness (Stilgoe et al., 2013). The most important achievements of art-based citizen engagement were: engaging people who would not have engaged with the topic otherwise, encouraging participants to question common phrases and assumptions, exploring future social implications of technologies, and staging meaningful interactions between citizens and professionals. The most significant challenge was to involve citizens in a way that could influence innovation trajectories.

Keywords: public participation; public engagement; inclusion; responsible research and innovation (RRI); impact; urban technologies; interaction design; art; theatre; science communication

Key messages

- Art-based citizen engagement can help to create room for citizen perspectives in 'smart cities'.
- The most important achievement of this case of art-based citizen engagement was that it staged memorable interactions between smart city professionals and citizens who normally do not engage with smart cities.
- The most significant challenge was to involve citizens in a way that could influence innovation trajectories.

Introduction

City governments acround the world are increasingly giving shape to the 'smart city' vision: the belief that the use of data and smart technologies can help cities to maintain stability and control in the face of impending overpopulation, economic crisis and climate change (Sadowski and Bendor, 2019). Although the simplicity of this vision is appealing to city governments, and to information and communications technology (ICT) companies (Sadowski and Bendor, 2019; Söderström et al., 2014), it also raises concerns and dilemmas, most notably related to increased dataveillance – the use of data to monitor and control citizens in the public space (Van Zoonen, 2021). Concerns include loss of privacy and security, and also increased ethical profiling, behavioural nudging and corporatisation (Bunders and Varró, 2019; Kitchin et al., 2016; Van Zoonen, 2016).

To address these concerns, citizens need to be included in smart city developments as experts on how they experience the city, and what they find important in it; however, the smart city currently offers little room for citizen input. Both city governments and ICT companies have called for more citizen participation in the smart city, claiming that this would make the smart city more ethically acceptable and generally more successful (Cardullo and Kitchin, 2019; Engelbert et al., 2019). In practice, however, citizen engagement initiatives in the smart city often fail to address citizen concerns, because citizens are typically invited to go along with, rather than to challenge, the smart city vision (Baibarac-Duignan and de Lange, 2021; Cardullo and Kitchin, 2019; Cowley et al., 2018; Engelbert et al., 2019).

How can citizens be engaged more meaningfully in the smart city? We started this study from the position that citizen engagement cannot lead to substantial change in technology development when it is performed as a one-off, stand-alone exercise. We therefore consider citizen engagement to be meaningful only when it is embedded in the processes of responsible innovation. Responsible innovation is a governance framework that describes how emerging technologies, such as digital technologies, biotechnology and nanotechnology, can be leveraged to address major challenges to society in a desirable and ethically acceptable way, according to citizens and stakeholders (Von Schomberg, 2011). Various models of responsible innovation exist, but the model of Stilgoe et al. (2013) is particularly helpful in our case because it outlines the dimensions considered vital to responsible innovation: (1) 'inclusion' – opening up to new publics and wider perspectives; (2) 'anticipation' – considering possible futures; (3) 'reflection' – reflecting on roles, assumptions and values; and (4) 'responsiveness' – making changes to individual and institutional behaviours, and to technological trajectories, accordingly. In this article, therefore, we consider citizen engagement to be meaningful when it is part of, and stimulates, these four responsible innovation dimensions.

It is not simple, however, to embed citizen engagement within responsible innovation. First, it is difficult to bring diverse citizen perspectives to the table. For example, the smart city seems most often to

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engage male participants who know their way around digital technologies (Engelbert et al., 2019; Vanolo, 2016). Second, it is challenging to make sure that participants can unpack what is at stake, and to imagine the social and ethical implications of new and emerging technologies (for example, Lehoux et al., 2020), and smart cities in particular are often narrowly imagined as neutral solutions that serve everybody equally (Van Zoonen, 2021). Third, it is challenging to make sure that citizen engagement events can influence ongoing innovation trajectories. As an outcome of public engagement, citizens may call for changes that are difficult to achieve by single actors, or that are actively resisted by actors who have something to lose.

This article builds upon the idea that some of these challenges may be addressed with *art-based* citizen engagement approaches. The visual and performing arts, for example, have been found to draw in wider audiences, to make the possible social and ethical aspects of emerging technologies more tangible, and to support reflection (Fraaije et al., 2022; Roeser and Steinert, 2019). In the context of the smart city, art projects have also successfully shown the cost of dataveillance, visualised the politics of data, and facilitated public reflection (de Lange et al., 2019; Monahan, 2018; Van Zoonen, 2021). Yet, there are also unresolved questions and challenges regarding the use of art for citizen engagement. Art projects can be difficult to steer, trigger sensation rather than reflection, and remain disconnected from innovation trajectories (de Lange and de Waal, 2013; Fraaije et al., 2022; Monahan, 2015; Van Zoonen, 2021).

Therefore, this study aimed to gain insight into *whether* and *how* art-based citizen engagement can foster room for citizen perspectives in the smart city innovation system. To this end, we developed and organised a case of art-based engagement in Amsterdam, the Netherlands, and analysed this case using the four responsible innovation dimensions as a conceptual model.

Research methodology

In the following sections, we first describe the case context and the engagement project, and we then discuss the conceptual framework and the research methods used for data collection and analysis.

Case context: Amsterdam

Our study followed a case study research design, meaning that we aimed to learn more about how art-based engagement can create room for citizen perspectives in the smart city by studying one art-based engagement project in particular. The project was situated in Amsterdam, one of the first cities in Europe to launch a smart city strategy and to win Europe's Capital of Innovation award. The smart city community in Amsterdam wants to leverage smart city technology for liveability and sustainability, but it has a strong economic and technological focus (Engelbert et al., 2019; Jameson et al., 2019). At the same time, Amsterdam has a traditionally left-progressive council and a history of resisting digitisation practices (Jameson et al., 2019). During our project, there was growing political awareness of increased datafication, especially when the General Data Protection Regulation (GDPR) came into effect. The municipality also signalled 'inclusion' as the main issue in its smart city agenda (Gemeente Amsterdam, 2019). In practice, however, citizens of Amsterdam have mainly been involved as test users or data producers, rather than as political subjects (Noori et al., 2020). Furthermore, Jameson et al. (2019) have shown that especially vulnerable groups in Amsterdam feel left in the dark about increased datafication and surveillance.

The project was specifically situated in Amsterdam-Noord, a city district with a highly diverse population in terms of income, education, age and ethnicity. This district was built at the beginning of the twentieth century to create homes for the working class. When the local factories closed down during the 1980s and 1990s, many workers lost their jobs (Milikowski, 2012), contributing to the stereotype of the original 'Noorderling' as White, old, poor and distrustful (Van Leeuwen, 2020). In the 1970s, the district attracted migrant workers with a non-Western background. Since the 2000s, the district has also attracted young, highly educated citizens looking for affordable living space.

Project Catalyst as a case of art-based engagement

This study was a form of transformative action research, meaning that we investigated art-based engagement by developing, organising and analysing an art-based engagement project ourselves. The project, called 'Catalyst', took place between March 2018 and August 2019. It was funded by the Dutch Research Council (NWO) and organised by members of two research institutes, a science museum and a smart city institute. Most of the authors of this article were the main organisers of the project (all but JB), and some doubled as interaction designers (MvdM, AV) or as theatre maker (FK).

The aim of Catalyst was to create room for citizen perspectives within the smart city innovation ecosystem of Amsterdam. To that end, we developed theatrical interventions, which were complemented with interaction design and social research methods to strengthen the connection with ongoing public debate and existing innovation trajectories. Specifically, we developed and performed interactive *street theatre* performances, a *tool for playful group conversations* in community centres, and a *theatrical dialogue event* for citizens and smart city professionals.

First, we set out to make citizens aware of dataveillance by organising two interactive street theatre performances in three shopping centres (see Box 1). The performances were inspired by Boal's (1998) 'invisible theatre', a form of street theatre developed to show oppression in daily life without the audience knowing that they are participating in a performance. In our case, the actors were later revealed as actors, so that we could reflect with participants on their experiences.

Next, we developed a playful tool (see Van der Meij et al., 2017) to help groups of citizens form and articulate their viewpoints on smart cities under the guidance of a trained facilitator (see Box 2). The tool aimed to open up exploration of what could be at stake in the smart city by widening the scope of social issues considered and by unpacking often-heard phrases (for example, 'I have nothing to hide').

Finally, we developed a theatrical dialogue event to facilitate conversation between citizens who had participated in one of the previous events and professionals who connected themselves to Amsterdam's smart city network. The dialogue event aimed to let citizens and professionals exchange perspectives, and potentially to broaden smart city professionals' reflexivity. During the event, actors would play out suggestions from the audience to explore hidden assumptions and possible consequences (see Kupper [2017] for a description of this interactive theatre format). Before the event, we spoke with 12 professionals to prepare them for participation, and to learn from them how the dialogue event could best impact their practices. Based on our conversations with both citizens and professionals, the theatrical dialogue was designed to explore in three scenes: (1) what values and interests are driving the smart city, and which ones are currently at stake; (2) how citizens and social values can give direction to smart city developments; and (3) how responsibility for smart city developments can be shared while all actors have incomplete overview and control (see Box 3).

Conceptual framework: responsible innovation

To identify if and how art-based engagement could create more room for citizen perspectives in the smart city, we analysed the case using the four dimensions of responsible innovation: inclusion, reflexivity, anticipation and responsiveness (Stilgoe et al., 2013), and generated a research question for each of them (see Table 1).

Inclusion concerns the involvement of citizens and other stakeholders (Stilgoe et al., 2013). Under the heading of responsible innovation, the quality of such involvement mainly depends upon the timeliness of the conversation, the willingness of technoscientific professionals and institutions to learn and listen, and the diversity of participating stakeholders and publics (Bauer et al., 2021; Sykes and Macnaghten, 2013). A recurring challenge has been to involve people in marginalised positions (for example, due to their ethnic background or socio-economic position), because people from these communities are typically less politically active, not as used or able to voice their opinions, or less knowledgeable about the topic than those citizens who tend to be over-represented (Boulianne, 2018; Ellard-Gray et al., 2015; Powell et al., 2011; Sturgis, 2014).

Box 1: Street theatre performances

The street theatre consisted of two interactive performances on dataveillance. The 'garbage performance' aimed to trigger awareness of what may count as personal data. Three actors pretended to be data analysts, and they asked passers-by to help identify personal information about a fictitious neighbour (Mr Baker) based upon what they could find in his rubbish. The 'tracking performance' aimed to trigger awareness of tracking and tracing in public space. The actors pretended to be urban planning researchers who wanted to collect data about the square. They first asked a passer-by whether they could follow them around. If this was agreed to, they went on to make their requests odder and more invasive, until the participant started to object. Finally, the actor asked permission to do the tracking with an application on the participant's phone.

After both performances, a researcher stepped in to ask follow-up questions and to trigger further self-reflection using a dialogic approach to interviewing (Way et al., 2015).

In addition to the street theatre performances and interviews, passers-by were invited for a chat and free coffee, advertised by a banner.

Box 2: Playful group conversations in community centres

The group conversations took place in three community centres near the shopping centres where we performed the street theatre. We joined existing activities, such as meeting for coffee, dinners and breakfasts, and we conducted the group conversations with whoever happened to be around. We developed a playful tool that helped groups of between three and six citizens to articulate and form their opinions about smart cities in five steps.

1) Build a fictional city as if they were city planners. The group received an abstract map and a selection of typical city locations, including a city centre, station, residential area, hospital, snack bar and school. The participants placed and clustered the city locations on the map as they saw fit.
2) Place smart city technology in this city as if they were civil servants. Each group received key information and a 3D model of three typical smart city technologies. The group decided together where these technologies should be placed in their city. The technologies were typical examples of smart city dataveillance: a smart rubbish bin, smart lamp post, smart traffic light, smart crowd-monitoring app, smart advertising display and smart surveillance camera. For each of these technologies, we searched for models that were in use in Europe, and we combined several of their traits in one archetypical technology.
3) Reflect on this technology from their personal perspective. Based upon the street interviews, we created 27 generalised example quotations which represented the values that citizens associated with the smart city (privacy, autonomy, power balance, efficiency, solidarity, cleanliness and so on). During the group conversations, participants selected one of these quotations and explained why it resonated with them.
4) Identify the values underlying their perspective. The group explored what personal values were informing their viewpoints through facilitated group conversation. The result for each person was recorded on a sticky note.
5) Redesign one of the smart technologies in line with their values. Participants were free to draw or write on the canvas and sticky notes under the facilitator's guidance.

Anticipation means to explore and consider unexpected societal implications during the innovation process, so that potential harmful effects and new opportunities can be identified at an early stage (Stilgoe et al., 2013). The role of citizen engagement is to help broaden conversations about what futures are possible and desirable (Stilgoe et al., 2013). A recurrent challenge is how to help citizens and professionals imagine the futures of technological innovations so that the ambiguities, uncertainties and complexities of those futures are maintained (Lehoux et al., 2020; Swierstra and te Molder, 2012).

Reflexivity entails deep reflection on the assumptions driving innovation, so that the limitations of these assumptions can become clear and can be considered in decision making (Stilgoe et al., 2013). The role of citizen engagement is therefore to stimulate reflection among citizens and/or technoscientific professionals. Involving citizens alone might enhance citizens' capacity to question science and technology (Davies et al., 2012; Selin et al., 2017), whereas interactions *between* citizens and professionals may stimulate reflexivity among the involved professionals as well (Delgado et al., 2011; Pallett and Chilvers, 2013). In both cases, a persistent challenge has been to enable participants to identify and articulate their underlying norms and values (Schuurbiers, 2011; Van der Meij et al., 2018).

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Box 3: Theatrical dialogue event

The dialogue event took place at the science museum that was involved in the study, to which citizen participants were transported by bus. The event started and ended with small group exercises to facilitate joint reflection, but the core of the event consisted of an interactive theatre performance. During the performance, participants were seated around a central space that functioned as a stage. A facilitator collected input from the audience and started, altered or stopped the improvised scenes accordingly. The performance consisted of three scenes.

1) The first scene explored what social values were at stake in the smart city. To that end, the sentiments of the audience were played out as they responded to an audiovisual installation about dataveillance in smart cities.
2) The second scene explored the differences between the perspectives of citizens and professionals by showing how both typically talk about a smart rubbish bin: while the professional envisioned a neighbourhood game that stimulated citizens to separate waste for recycling purposes, the citizen worried about litter and about having no room for separate bins in the kitchen.
3) The third scene explored shared responsibilities for change. Before this scene, the participants were split into three groups according to their respective stakeholder type (citizen, societal organisation or commercial organisation). Each group spoke with one actor about their values, interests and questions. During the scene, each actor represented one stakeholder type in conversation with the other actors about their mutual responsibilities.

Table 1. Research questions for responsible innovation dimensions (Source: Authors, 2023)

Responsible innovation dimension	Research question
Inclusion	To what extent were diverse publics – especially marginalised groups – enabled to engage with ongoing innovation trajectories?
Anticipation	To what extent were participants enabled to imagine possible and desirable futures?
Reflexivity	To what extent were participants enabled to reflect on their viewpoints, and their underlying norms and values?
Responsiveness	To what extent were (professional) participants enabled to listen to, and learn from, citizens?

Responsiveness is about changing the course of technological trajectories in response to the other innovation dimensions (Stilgoe et al., 2013). In this context, the role of citizen engagement may be to foster the capacity of technoscientific individuals and institutions to listen to, and learn from, citizens (Bauer et al., 2021; Krabbenborg and Mulder, 2015). The challenge is to foster both an openness and an attentiveness towards emerging issues and publics, as well as the ability actually to act on those emerging insights (see Kupper et al., 2015).

Methods for data collection and analysis

To investigate participants' experiences of the street theatre performances, we conducted semi-structured interviews with participants (n = 107, lasting between five and ten minutes). To minimise the threshold for participation, we did not record the interviews, but made audio notes directly after each interview and transcribed the notes. We subsequently excluded any interview that showed insufficient prior engagement with either of the street performances (n = 22), so that we included 85 street interviews in total.

To study the group conversations, we performed unstructured observations, photographed participants' materials (for example, sticky notes), and audio recorded and transcribed the group conversations (n = 11, about 75 minutes). We excluded one group conversation during which language difficulties had prevented the participants from engaging with the materials, leaving 10 group conversations for analysis in total.

To study the dialogue event, we audio recorded and transcribed the event (three hours) and carried out a series of semi-structured evaluation interviews with participants afterwards (n = 10, about 30 minutes).

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We thematically analysed (Braun and Clarke, 2006) all interviews, observations and event transcriptions using the qualitative analysis software package MAXQDA 18. The data were analysed based on the responsible innovation dimensions. For each dimension, we looked for the desired *outcomes* and required *processes* in line with the literature review on art-based methods for public engagement with emerging technologies by Fraaije et al. (2022). In addition, we paid special attention to the *challenges* related to achieving the outcomes and/or processes of each dimension. Coding choices were explicated in extensive memos, and were discussed with co-workers both internal and external to the engagement project.

In terms of ethics, we applied the rules of good conduct for qualitative empirical research, such as obtaining informed consent, sending summaries of interviews to interviewees for member checks, and using secure and anonymous data processing. The street theatre warranted extra moral reflection, because it relied upon deception: citizens were engaged before they knew that they were participating in a research study. We applied this technique because we aimed to investigate how to involve citizens who normally do not take part in discussions about new technologies. To increase the acceptability of this technique, we did not record the street performances or the street interviews, and we did not collect direct identifiers, such as name or age. As a consequence of this, we only noted what we found striking at the moment of recording, so the data were already filtered at this point, and we could not subsequently analyse the data using interpretations that we did not apply the first time. We did not expect this technique to induce any discomfort or stress beyond that normally encountered in public space, but we alleviated any emotional distress by debriefing participants about their participation immediately after the theatre performance, and by applying empathetic interview techniques to express our understanding and support.

Results

Below, we describe the outcomes, processes and challenges of the art-based citizen engagement project Catalyst for each responsible innovation dimension.

Inclusion

Outcomes

To what extent were diverse publics – especially marginalised groups – enabled to engage with ongoing innovation trajectories? In total, more than 100 citizens interacted with one of the two *street theatre* performances, 43 citizens participated in one of the 10 *playful group conversations*, and 25 participants participated in the *dialogue event* (10 citizens and 15 professionals). Each event engaged diverse citizens: the participants in the street theatre reflected the diversity of the population of Amsterdam-Noord, including 'old Noorderlingen' (typically White, older, working-class people), people with a non-Western migration background and young urban professionals. The group conversations in community centres engaged members of vulnerable groups, most prominently women with a non-Western migration background, people with intellectual disabilities and elderly people. The dialogue event was open to participants of the former events, so it also engaged a diverse audience. One professional described the dialogue event audience as:

> Male, female, all ages. People who work, people who, with all due respect, probably don't have a job outside the home. Yes, all sorts of people. Various nationalities. So yes, I just thought it was very diverse.

Importantly, the engaged citizens were primarily people who did not normally engage with the topic of smart cities. Various participants commented that it was uncommon for them to discuss this topic, and that topics such as this were not normally discussed in their city district. Despite their inexperience, the citizens were well able to participate throughout all events: they shared valid and relevant perspectives

on smart cities, and several citizens dared to speak up at the plenary session during the dialogue event – and some even joined the actors on stage.

Processes

Participation by diverse citizens was enabled in various ways. First, many of the participants joined the events because they did not have to come to the events deliberately: in particular, the *street theatre* performances and *group conversations* were incorporated into an activity that people were going to do anyway, such as shopping, drinking coffee or having breakfast together. This allowed people to get involved in a step-by-step manner. The street theatre, for example, drew the attention of a diverse crowd with a notable installation and with the offer of free coffee, after which people could come closer at their own pace and end up having conversations about smart cities. Joining existing activities and communities was only possible because we established relationships with the coordinators of the community centres: they helped us design activities that would fit their specific centre, and they gathered potential participants for our activities.

Participants were motivated to stay, or to join a second time, because they had a good time; they often laughed and made jokes. The significance of the events as a form of leisure activity was also shown by participants' enthusiasm about taking our bus to the *dialogue event* – they were excited not because this facilitated travel, but because this made 'a day out' of it. Furthermore, participants said that they appreciated the meaningful conversations that they had with each other and with the researchers, and that they enjoyed making contributions that were valued by the facilitator and by other participants. In addition, some participants appreciated learning about things that were going on in their city. One participant, for example, let us know that she was positively surprised when she successfully recognised discussion about smart cities on the radio after her participation in a group conversation.

Finally, inexperienced participants were enabled to talk about smart cities by being provided with words with which to do so. The events were connected to people's daily lives, so that they could talk about their personal experiences, rather than using smart city jargon. The 'tracking' street performance, for example, linked smart cities to their next shopping destination, and the group conversations required participants to situate themselves in the city that they had designed. The facilitators and interviewers also helped citizens to articulate their perspective by summarising citizen responses. More specifically, the group conversations offered various ways to express a viewpoint in plain language by offering quotations on cards during Step 3 (see Box 2).

Challenges

Enabling diverse citizens to participate as envisioned presented various challenges, depending on the specifics of the particular event. The *street theatre* was not always perceived as theatre; some people took the performances to be reality, and they spoke to us as if we represented the municipality – even after we had emphasised that the performance was not real. Furthermore, some people did not like to be approached on the street, especially when they thought that we were street vendors or smart city promoters. For the *group conversations*, it was challenging to balance the depth that we sought with the amount of time, skill and attention that we requested from the participants. Originally, the group conversations were designed to last for three hours, but we reduced this to one hour on the advice of the community centre coordinators. Also, joining existing events meant that we had little control over who and how many would be joining. For example, the community centres were open to members with a migration background who did not speak Dutch (well), so that, for some participants, the events were more of a language-learning exercise than a discussion about emerging technologies. Also, we had to accept distractions, such as nearby activities going on, or participants who were called away for a short time. The *dialogue event* mostly attracted citizens who were organisers and volunteers at their respective community centres. These people were perhaps more willing, better able and more used to taking part in

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participation projects than other members of their communities. Participation in the dialogue event was furthermore restricted by cultural norms; for example, two Muslim women could not join, because there would be men present.

Professionals were eager to come to the dialogue event, and they usually participated actively, but it was challenging to engage them in a way that would allow citizens to influence innovation trajectories. First, the attending professionals were usually working on innovation strategy, sales or marketing, rather than on technology development, and they were more likely to work in the public than in the private sector. Second, professionals' reasons for joining the dialogue event did not align well with the objectives of the dialogue. Professionals joined the dialogue event to: (1) explore the market for their (future) products; (2) contribute to citizen education; and (3) learn more about smart city participation from scientists (us). None of these objectives left much room for citizen perspectives to be included in the innovation ecosystem.

Anticipation

Outcomes

During our events, we witnessed a heightened awareness of what the future city could and should look like, among both citizens and professionals. Citizens could articulate how smart city technologies would interact with their future daily lives. For example, they explored the effect of a smart traffic light on the possibilities of getting lost in the city, chatting with neighbours and rushing to school. For their part, professionals seemed more aware of the *diversity* of imagined futures. This was not always a pleasant realisation for them, however. Reflecting on the *dialogue event*, for example, a corporate professional said that he now better valued citizen perspectives, but that he also felt relieved that 'a company is not a democracy', because he did not have the patience to account for such diverse perspectives in his day job.

Processes

Participants were enabled to (re)define their expectations of the future in various ways, depending on the specific event. The *street theatre* mainly helped citizens to articulate their expectations of the future by triggering memories of similar experiences and situations. Participants of the 'tracking' street performance, for example, recalled other situations in which they had been approached by strangers in a similar way (such as when they were offered personalised advertisements online, or received unexpected newsletters). In this way, citizens related the possible implications of the smart city to their experiences with other, more familiar, digital technologies and services.

The *group conversations* mainly helped citizens to explore the potential implications of smart city technologies by challenging participants to look for connections between their values and the future technologies in question. This was because participants were asked to redesign future smart city technologies in line with their personal values. A participant who had identified 'wandering about in a new city' as an important value redesigned the traffic light so that it would cause people to get lost in the city, thereby encouraging them to wander about (the 'lost pole'). Another participant, who valued 'a sense of togetherness in the neighbourhood', made sure that the light was on red more often, so that people would be more inclined to strike up conversations with each other while they waited to cross the road. Although these ideas may seem funny – or even silly – at first, they do explore the important question of how the technologies might interfere with what matters to people, and they thereby broaden expectations of what is at stake in the smart city.

The *dialogue event* mainly supported anticipation by bringing different expectations of the future city into confrontation with each other. One scene that several participants later referred to as being particularly insightful was when the actors performed a conversation between citizens and a smart city professional about a future waste bin. While the smart city professional expected that the waste bin would encourage citizens to participate in a neighbourhood game to improve recycling scores, the citizens were concerned about the litter *around* the waste bin, and they worried that poor people would be

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disproportionately punished because of their lack of kitchen space for recycling bins. The dialogue event could show these differences in perspective because participants were invited to correct the scene as they saw fit. Over time, therefore, the scenes became more in line with the various views of the participants.

Challenges

The *dialogue event* in particular confronted participants with their differences, and it was challenging to offer all participants the support that they needed to deal with this confrontation. In several instances, for example, the audience (which included professionals) suggested that big corporations such as Google were mainly driven by profit, and that corporate employees were typically insincere, self-involved and incompetent. A few professional participants later noted that the scenarios were perhaps somewhat exaggerated, but one (corporate) professional was particularly unhappy with the way in which innovators were depicted:

> The people … don't give us [innovators] the benefit of the doubt. … They think of us as Big Brother as opposed to a partner. … Definitely during the theatre part of it. The perception I think was communicated was that people who are the innovators are just there to make money and sell something to the city. And use the public as a sort of a guinea pig.

This corporate professional said that innovators *do* care about citizens, because they want to create 'real value' for their 'end users'. This innovator had been confronted with how others might view him, and he required some additional 'therapy' to deal with this realisation.

Reflexivity

Outcomes

During all the events, both citizens and professionals showed signs of self-reflection by switching sides or expressing doubt. For example, a citizen engaged with one of the *street theatre* performances for a long time before he concluded that the proposed technology was 'half-good'. In particular, professionals from the public sector sometimes reflected upon the limitations of their own roles and perspectives. For example, one of the professionals said that they had learned that:

> [vulnerable] groups like these should not only be invited with the purpose of informing them, but also the other way around; we can actually learn much *from them*.

Importantly, participants sometimes investigated the smart city beyond their initial responses. Although some conversations got stuck on common phrases (see 'Challenges', below), other conversations allowed participants to question the underlying assumptions of such phrases. A street interview participant, for example, first said that she had 'nothing to hide', but she later added, 'Well, it must be your own choice', and then:

> Perhaps I'm naive. I have the feeling that we can make our own choices, but maybe we don't any more and maybe I am allowing something that I can't completely oversee any more.

In this way, the participant first relied on a catchphrase, later identified a personal value (autonomy), and finally reflected on her position in relation to technology processes in general.

Processes

In all of the events, the critical questions from facilitators, actors and other participants gave people reason to reflect on their own viewpoints. This worked because it was personal and flexible: people could respond to, and play with, what others had offered. The theatrical debate was the most systematic test of the assumptions of the participants because it played them out in practice. In this way, participants

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were confronted with the consequences and limitations of their assumptions. For example, when one participant suggested that the proposed technology was problematic because it did not fit in with its environment aesthetically, the actors 'solved' the problem by making the technology invisible. This paved the way for the audience to further explore what else was problematic about the situation.

Humour was an important instrument in the process of identifying and testing hidden assumptions. When a participant during the *dialogue event* said that 'privacy' was at stake, the host asked dryly, 'Privacy, what is that?' This brought a burst of laughter from the audience, because it revealed that although the term 'privacy' is used a lot, its meaning is not self-evident.

Challenges

There were multiple challenges to stimulating self-reflection. First, some aspects of the smart city were so repulsive to citizens that they were dismissed at first glance. Smart advertising technology, for example, was often rejected because it was thought to serve commercial, rather than public, interests. Furthermore, some citizens were generally distrustful of the government and the economic system, and were more concerned with being heard than with reflecting on their viewpoints. The opposite also happened, when citizens and professionals were not concerned enough for them to want to enquire further. For example, participants said: 'I have nothing to hide', 'We'll get rid of the technology if we don't like it' and 'They're not looking for me anyway'. Self-reflection was further complicated by the fact that participants seemed generally hesitant to express concerns: participants frequently apologised for critical remarks and invalidated each other's concerns. During the *dialogue event*, for example, a professional raised a concern, after which a citizen asked the professional: 'But what are you afraid of?' Rather than exploring what frightened him, the professional quickly replied: 'I'm not afraid of anything. I've already completely given up on privacy anyway.' In this example, the self-reflection process is shut down by associating 'having concerns' with 'being afraid', thereby trivialising any further reflection.

Responsiveness

Outcomes

At an individual level, as a result of the events, most professionals expressed the intention to work on projects that were more closely connected to the lifeworld of citizens. For example, a professional from a consultancy firm said that he wanted to work on projects in which citizens themselves were involved (instead of the municipality as their representative). Furthermore, several professionals said that they wanted to communicate differently with citizens; four professionals specifically mentioned the idea of using the theatrical dialogue format.

At the institutional level, the *dialogue event* did not foster any organisational or systemic changes (for example, in terms of new relations or networks). As a possible precursor to those outcomes, however, the dialogue event did stage new interactions that caused citizens and professionals to adjust their image of each other. For example, one citizen reported that they better understood and appreciated what these professionals were working on. Similarly, several professionals were positively surprised by the citizens that they met. One professional felt that citizens in big cities often 'express a kind of dissatisfaction', even though professionals like himself try to improve citizens' quality of life. He was positively surprised that these citizens were not necessarily against the offered solutions, but were willing to provide sincere input. This motivated him to continue working on projects for the public space.

Processes

Professionals started to better understand the citizen perspective in various ways. First, the *dialogue event* invited professionals to look at the issues from a citizen perspective. One of the professionals said that this made the event very special for her:

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> Thanks to the theatrical performance you were pushed into a certain role, which caused you to act based on your emotions or think along based on your emotions. Instead of thinking super rationally about all the theories that you've learned, and about all the projects that you've done in the past.

Second, informal talks with citizens during the breaks also made an impression on professionals, to which they would later refer. Being able to observe citizens as they were participating allowed professionals to adjust further their assumptions about citizens. Several participants of the dialogue event later referred to one instance as being particularly informative: one of the citizens took the stage to defend an optimistic, hopeful citizen to counterbalance citizens who were more concerned. For several professionals, this showed that not all citizens think about smart cities in the same way.

Challenges

Since the *dialogue event* was a single event, we did not expect impacts at the institutional level. The *intentions* for change were somewhat humbling, however. Professionals typically proposed including citizens more by working on citizen education, transparency, user research or informative digital platforms. Even though at first sight, these suggestions do seem to include citizens, they still imagine citizens as a technology user who needs to get 'on board', rather than as a political subject who has the right to co-shape the future of their city.

Discussion and conclusion

The results indicate that interactive theatre, and the way in which it was complemented with interaction design and social research methods in this case study, can support all dimensions of responsible innovation: inclusion, anticipation, reflexivity and – to a lesser extent – responsiveness. These outcomes were achieved through a combination of events. The *street theatre* triggered associations, and so generated a wide range of perspectives that were closely connected to people's lives. During the *group conversations*, there was more time to build trust with the organisers, and to become familiar with the topics, so that deeper reflections could emerge among vulnerable groups. Finally, the *dialogue event* staged memorable interactions between citizens and professionals, which allowed each party to positively adjust its image of the other.

As such, the art-based citizen engagement events described here fit well into the growing range of playful and material public engagement methods described in the literature (for examples, see Davies et al., 2012; Van der Meij et al., 2017). Although diverse, these methods do generally excel at engaging wider perspectives, triggering in-depth reflections and exploring the social implications of future technologies, while they struggle with perceived plausibility and relevance. Perhaps the most distinctive aspect of the approach studied here was how it staged interactions between innovation professionals and people who had never expressed their political views on smart cities before, including people at the fringes of society.

Implications

This study makes it clear that involving wider publics and perspectives with the smart city is not a trivial matter. Even though the involved professionals wanted to prioritise inclusion, this was mainly envisioned as a form of market and user research. This interpretation of 'inclusion' prioritises governmental and corporate interests, and ignores the voices of people who are not users themselves (but can, of course, be the *object* of dataveillance). As such, the study shows that there is a need for stimulating broader societal conversations, beyond marketing and user research, which can help locate urban data practices and technologies within a bigger picture.

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Furthermore, the study emphasises the importance of methods that can question common phrases and assumptions in the smart city debate. Although both citizens and professionals had societal concerns, they were keen to dismiss those concerns, rather than to express and explore them. This is in line with the work of Bunders and Varró (2019), who find that smart city professionals in the Netherlands are often 'reflective-but-accepting' of societal concerns. For more responsible innovation, therefore, (art-based) engagement methods should help citizens and professionals to critically examine the ideologies and the conversation dynamics that determine smart city debates.

Limitations and generalisability

An important limitation of this study is that the case study approach does not allow for a comparison with more traditional citizen engagement methods, such as citizen juries or consensus conferences. Instead, the case study provides insights into how a specific art form, in a specific context, fostered various responsible innovation outcomes. The reader should take into account, for example, that the Netherlands offered a receptive environment for the engagement project, thanks to its prominent deliberative culture and relatively high level of trust in institutions. As such, participants generally perceived the topic of smart cities to be relevant and urgent, even though they also found it to be complex.

It is also important to note that most of the authors of this study designed and executed the engagement events, and were therefore at risk of confirming their assumptions during data analysis. Therefore, conversations with the last author (JB) – who had not participated in the design or execution of the project – were crucial to illuminate blind spots.

Recommendations

The results suggest that even though art-based citizen engagements may be able to set the stage for broader societal reflections, they do not by themselves create new innovation practices – engagement was not long or intensive enough for that. However, there are other methods that can influence innovation trajectories, such as midstream modulation (Fisher and Schuurbiers, 2013). Midstream modulation requires a researcher to enter the innovation lab for long periods, where they incite reflection by asking questions about what and why certain decisions are taken. In this way, midstream modulation can incite change among technoscientific professionals, but it is based on the idea that the researcher can adequately represent societal concerns. Art-based citizen engagement may complement approaches such as midstream modulation by discussing societal concerns in the public sphere, where they can be investigated from more diverse angles.

Conclusion

This case study suggests that art-based citizen engagement can help create room for citizen perspectives in the smart city innovation system, most notably by staging interactions between smart city professionals and people who do not normally talk about smart cities. As such, art-based engagement can expand the notion of inclusion in the smart city, which is otherwise often limited to user and market research. Art-based citizen engagement can thereby complement other methods for responsible innovation that intervene more directly in technological trajectories.

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Declarations and conflicts of interest

Research ethics statement

The authors conducted the research reported in this article in accordance with the ethics standards of the Faculty of Science, Vrije Universiteit Amsterdam.

Consent for publication statement

The authors declare that research participants' informed consent to publication of findings – including photos, videos and any personal or identifiable information – was secured prior to publication.

Conflicts of interest statement

The authors declare no conflicts of interest with this work. All efforts to sufficiently anonymise the authors during peer review of this article have been made. The authors declare no further conflicts with this article.

References

Baibarac-Duignan, C. and de Lange, M. (2021) 'Controversing the datafied smart city: Conceptualising a "making-controversial" approach to civic engagement'. *Big Data and Society*, 8 (2). https://doi.org/10.1177/20539517211025557.

Bauer, A., Bogner, A. and Fuchs, D. (2021) 'Rethinking societal engagement under the heading of Responsible Research and Innovation: (Novel) requirements and challenges'. *Journal of Responsible Innovation*, 8 (3), 342–63. https://doi.org/10.1080/23299460.2021.1909812.

Boal, A. (1998) 'Invisible theater'. In J. Cohen-Cruz (ed.), *Radical Street Performance: An international anthology*. London: Routledge, 121–4.

Boulianne, S. (2018) 'Beyond the usual suspects: Representation in deliberative exercises'. In L.L. Hanson (ed.), *Public Deliberation on Climate Change: Lessons from Alberta Climate Dialogue*. Edmonton, AB: Athabasca University Press, 109–32. https://doi.org/10.15215/aupress/9781771992152.01.

Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology'. *Qualitative Research in Psychology*, 3 (2), 77–101. https://doi.org/10.1191/1478088706qp063oa.

Bunders, D.J. and Varró, K. (2019) 'Problematizing data-driven urban practices: Insights from five Dutch "smart cities"'. *Cities*, 93, 145–52. https://doi.org/10.1016/j.cities.2019.05.004.

Cardullo, P. and Kitchin, R. (2019) 'Being a "citizen" in the smart city: Up and down the scaffold of smart citizen participation in Dublin, Ireland'. *GeoJournal*, 84 (1), 1–24. https://doi.org/10.1007/s10708-018-9845-8.

Cowley, R., Joss, S. and Dayot, Y. (2018) 'The smart city and its publics: Insights from across six UK cities'. *Urban Research and Practice*, 11 (1), 53–77. https://doi.org/10.1080/17535069.2017.1293150.

Davies, S.R., Selin, C., Gano, G. and Pereira, Â.G. (2012) 'Citizen engagement and urban change: Three case studies of material deliberation'. *Cities*, 29 (6), 351–7. https://doi.org/10.1016/j.cities.2011.11.012.

de Lange, M. and de Waal, M. (2013) 'Owning the city: New media and citizen engagement in urban design'. *First Monday*, 18 (11). https://doi.org/10.5210/fm.v18i11.4954.

de Lange, M., Synnes, K. and Leindecker, G. (2019) 'Smart citizens in the hackable city: On the datafication, playfulness, and making of urban public spaces through digital art'. In C.S. Costa, I.Š. Erjavec, T. Kenna, M. de Lange, K. Ioannidis, A. Maksymiuk and M. de Waal (eds), *CyberParks – The Interface Between People, Places and Technology: New approaches and perspectives*. Cham: Springer Nature Switzerland, 157–66. https://doi.org/10.1007/978-3-030-13417-4.

Delgado, A., Kjølberg, K.L. and Wickson, F. (2011) 'Public engagement coming of age: From theory to practice in STS encounters with nanotechnology'. *Public Understanding of Science*, 20 (6), 826–45. https://doi.org/10.1177/0963662510363054.

Ellard-Gray, A., Jeffrey, N.K., Choubak, M. and Crann, S.E. (2015) 'Finding the hidden participant: Solutions for recruiting hidden, hard-to-reach, and vulnerable populations'. *International Journal of Qualitative Methods*, 14 (5), 1–10. https://doi.org/10.1177/1609406915621420.

Engelbert, J., Van Zoonen, L. and Hirzalla, F. (2019) 'Excluding citizens from the European smart city: The discourse practices of pursuing and granting smartness'. *Technological Forecasting and Social Change*, 142, 347–53. https://doi.org/10.1016/j.techfore.2018.08.020.

Fisher, E. and Schuurbiers, D. (2013) 'Socio-technical integration research: Collaborative inquiry at the midstream of research and development'. In N. Doorn, D. Schuurbiers, I. Van de Poel and M.E. Gorman (eds), *Early Engagement and New Technologies: Opening up the laboratory*. Dordrecht: Springer, 97–111. https://doi.org/10.1007/978-94-007-7844-3_5.

Fraaije, A., Van der Meij, M.G., Kupper, F. and Broerse, J.E.W. (2022) 'Art for public engagement on emerging and controversial technologies: A literature review'. *Public Understanding of Science*, 31 (6), 1–17. https://doi.org/10.1177/09636625221093213.

Gemeente Amsterdam (2019) *Een Digitale Stad voor én van iedereen*. Accessed 21 February 2023. https://assets.amsterdam.nl/publish/pages/982390/agenda_digitale_stad_v3.pdf.

Jameson, S., Richter, C. and Taylor, L. (2019) 'People's strategies for perceived surveillance in Amsterdam Smart City'. *Urban Geography*, 40 (10), 1467–84. https://doi.org/10.1080/02723638.2019.1614369.

Kitchin, R., Lauriault, T. and McArdle, G. (2016) 'Smart cities and the politics of data'. In S. Marvin, A. Luque-Ayala and C. McFarlane (eds), *Smart Urbanism: Utopian vision or false dawn?* London: Routledge, 16–33.

Krabbenborg, L. and Mulder, H.A.J. (2015) 'Upstream public engagement in nanotechnology: Constraints and opportunities'. *Science Communication*, 37 (4), 452–84. https://doi.org/10.1177/1075547015588601.

Kupper, F. (2017) 'The theatrical debate: Experimenting with technologies on stage'. In I. Van de Poel, L. Asveld and D.C. Mehos (eds), *New Perspectives on Technology in Society: Experimentation beyond the laboratory*. London: Routledge, 80–102.

Kupper, F., Klaassen, P., Rijnen, M., Vermeulen, S. and Broerse, J.E.W. (2015) *Report on the Quality Criteria of Good Practice Standards in RRI*. Amsterdam: RRI Tools. Accessed 11 February 2023. https://www.fosteropenscience.eu/content/report-quality-criteria-good-practice-standards-rri.

Lehoux, P., Miller, F.A. and Williams-Jones, B. (2020) 'Anticipatory governance and moral imagination: Methodological insights from a scenario-based public deliberation study'. *Technological Forecasting and Social Change*, 151, 119800. https://doi.org/10.1016/j.techfore.2019.119800.

Milikowski, F. (2012) 'De oversteek van de nieuwe Noorderlingen'. *De Groene Amsterdammer*, 17 October. Accessed 7 May 2021. https://www.groene.nl/artikel/de-oversteek-van-de-nieuwe-noorderlingen.

Monahan, T. (2015) 'The right to hide? Anti-surveillance camouflage and the aestheticization of resistance'. *Communication and Critical/Cultural Studies*, 12 (2), 159–78. https://doi.org/10.1080/14791420.2015.1006646.

Monahan, T. (2018) 'Ways of being seen: Surveillance art and the interpellation of viewing subjects'. *Cultural Studies*, 32 (4), 560–81. https://doi.org/10.1080/09502386.2017.1374424.

Noori, N., Hoppe, T. and de Jong, M. (2020) 'Classifying pathways for smart city development: Comparing design, governance and implementation in Amsterdam, Barcelona, Dubai, and Abu Dhabi'. *Sustainability*, 12 (10), 4030. https://doi.org/10.3390/su12104030.

Pallett, H. and Chilvers, J. (2013) 'A decade of learning about publics, participation, and climate change: Institutionalising reflexivity?' *Environment and Planning A*, 45, 1162–83. https://doi.org/10.1068/a45252.

Powell, M., Colin, M., Kleinman, D.L., Delborne, J. and Anderson, A. (2011) 'Imagining ordinary citizens? Conceptualized and actual participants for deliberations on emerging technologies'. *Science as Culture*, 20 (1), 37–70. https://doi.org/10.1080/09505430903567741.

Roeser, S. and Steinert, S. (2019) 'Passion for responsible technology development: The philosophical foundations for embedding ethicists and artists in technology-projects'. *Royal Institute of Philosophy Supplement*, 85, 87–109. https://doi.org/10.1017/S135824611800070X.

Sadowski, J. and Bendor, R. (2019) 'Selling smartness: Corporate narratives and the smart city as a sociotechnical imaginary'. *Science Technology and Human Values*, 44 (3), 540–63. https://doi.org/10.1177/0162243918806061.

Schuurbiers, D. (2011) 'What happens in the lab: Applying midstream modulation to enhance critical reflection in the laboratory'. *Science and Engineering Ethics*, 17 (4), 769–88. https://doi.org/10.1007/s11948-011-9317-8.

Selin, C., Rawlings, K.C., Davies, S.R. and Guston, D.H. (2017) 'Experiments in engagement: Designing public engagement with science and technology for capacity building'. *Public Understanding of Science*, 26 (6), 634–49. https://doi.org/10.1177/0963662515620970.

Söderström, O., Paasche, T. and Klauser, F. (2014) 'Smart cities as corporate storytelling'. *City*, 18 (3), 307–20. https://doi.org/10.1080/13604813.2014.906716.

Stilgoe, J., Owen, R. and Macnaghten, P. (2013) 'Developing a framework for responsible innovation'. *Research Policy*, 42 (9), 1568–80. https://doi.org/10.1016/j.respol.2013.05.008.

Sturgis, P. (2014) 'On the limits of public engagement for the governance of emerging technologies'. *Public Understanding of Science*, 23 (1), 38–42. https://doi.org/10.1177/0963662512468657.

Swierstra, T. and te Molder, H. (2012) 'Risk and soft impacts'. In S. Roeser, R. Hillerbrand, P. Sandin and M. Peterson (eds), *Handbook of Risk Theory: Epistemology, decision theory, ethics, and social implications of risk*. Dordrecht: Springer, 1049–66. https://doi.org/10.1007/978-94-007-1433-5.

Sykes, K. and Macnaghten, P. (2013) 'Responsible Innovation – Opening up dialogue and debate'. In R. Owen, J. Bessant and M. Heintz (eds), *Responsible Innovation: Managing the responsible emergence of science and innovation in society*. London: Wiley, 85–108. https://doi.org/10.1002/9781118551424.ch5.

Van der Meij, M.G., Broerse, J.E.W. and Kupper, F. (2017) 'Conceptualizing playfulness for reflection processes in responsible research and innovation contexts: A narrative literature review'. *Journal of Responsible Innovation*, 4 (1), 43–63. https://doi.org/10.1080/23299460.2017.1326258.

Van der Meij, M.G., Heltzel, A.A.L.M., Broerse, J.E.W. and Kupper, F. (2018) 'Frame reflection lab: A playful method for frame reflection on synthetic biology'. *NanoEthics*, 12 (2), 155–72. https://doi.org/10.1007/s11569-018-0318-9.

Van Leeuwen, E. (2020) '"Stop met stereotypering van de oude Noorderling"'. *Het Parool*, 12 June. Accessed 7 May 2021. https://www.parool.nl/columns-opinie/stop-met-stereotypering-van-de-oude-noorderling~b8452ad6/.

Van Zoonen, L. (2016) 'Privacy concerns in smart cities'. *Government Information Quarterly*, 33 (3), 472–80. https://doi.org/10.1016/j.giq.2016.06.004.

Van Zoonen, L. (2021) 'Performance and participation in the panopticon: Instruments for civic engagement with urban surveillance technologies'. In G. Jacobs, I. Suojanen, K.E. Horton and P.S. Bayerl (eds), *International Security Management: New solutions to complexity*. Cham: Springer, 243–54.

Vanolo, A. (2016) 'Is there anybody out there? The place and role of citizens in tomorrow's smart cities'. *Futures*, 82, 26–36. https://doi.org/10.1016/j.futures.2016.05.010.

Von Schomberg, R. (2011) 'Introduction'. In R. Von Schomberg (ed.), *Towards Responsible Research and Innovation in the Information and Communication Technologies and Security Technologies Fields*. Luxembourg: European Commission, 7–16.

Way, A.K., Kanak Zwier, R. and Tracy, S.J. (2015) 'Dialogic interviewing and flickers of transformation: An examination and delineation of interactional strategies that promote participant self-reflexivity'. *Qualitative Inquiry*, 21 (8), 720–31. https://doi.org/10.1177/1077800414566686.