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Governance and risk in everyday life: depoliticization and citizens' experiences of cell site deployment in the Netherlands and Southern California

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ABSTRACT

This paper uses multi-level longitudinal mixed-methods to map changes in citizens' experiences of technological risks and asks if these are influenced by risk governance. We focus on the uncertain health risks of mobile phone cell sites. We quantitatively survey a national level panel of citizens in the Netherlands and make use of mixed-method panels of citizens who are being confronted with siting practices in the Netherlands and Southern California.

We find that often and unsurprisingly cell site deployment is of limited importance in the everyday lives of citizens. However, at closer inspection we find three ways in which risk governance affects citizens' experiences. First, the framing of cell site deployment among citizens closely resembles the frames in policy. Second, following the depoliticization of cell phone health risks, the absence of alarming health effects and the withering of public debate, a stable three quarter of citizens seems unconcerned for a couple of years, while an equally stable quarter reports health worries. This stability is in line with the stabilized dominant policy discourse. Third, on an individual and local level, we do find some changes in citizens' risk perception, framings, feelings and – albeit very limited, actions. These changes can partly be traced to local siting procedures. Our findings point to the need to examine the concrete practices through which a problem and its public emerge over time in the context of wider dominant political discourses.

The footprint of cell phone technology

Cell phones have become a ubiquitous necessity for many, with considerable consequences for the micro-coordination of everyday life (Katz 2008, 1–11; Wajcman 2008). The exponential growth in cell phone use is enabled by about 6.5 million cell sites, or base-stations, worldwide (Waring 2017). This global wireless cellular network has a significant local and material footprint, and citizens often protest cell site deployment in their neighborhood. These protests generally, though not exclusively, revolve around the possible health risks associated with the radio-

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frequent electromagnetic fields (EMF) emitted by cell site (and phone) antennas' signal trans-mitters (cf Drake 2011). The first protests started in the early 1990s, cell sites have been broken down as a result of citizens' protests (Burgess 2004, 7), and about 33% of Europeans believe that cell sites significantly affect their health (TNS 2010). While protest has seemingly calmed down, in the Netherlands 21% of citizens continue to express concerns about the health risks of cell sites (De Graaff 2016). Moreover, in at least a quarter of Dutch municipalities, protests emerged at one time (Hermans 2014, 11) and health concerns continue to do so – in the Netherlands most recently with debates on the roll-out of the 5G network (AD 2018) or, in California, with smart-meters (Hess 2014).

The continued worries and protests present us with a puzzle. Whereas large-scale, inter-disciplinary and international research programs have been executed without finding evidence for adverse health effects (e.g. Interphone Study Group 2010: SCENHIR 2015), a significant proportion of citizens remain concerned about the possible health risks of EMF. Where do these worries come from? In this paper, we search for an explanation in the way uncertainty about technological risks is dealt with politically. We look at risk governance practice and ask if and how over time citizens' experiences of cell site deployment are affected by its risk governance.

The contingent nature of the experience of risk and its political and cultural specificities are well documented (e.g. Boholm, Corvellec, and Karlsson 2012; Boholm and Corvellec 2011). The effects of risk governance practices are less well understood (e.g. Wiedemann et al. 2013). What is missing is a thorough understanding of the 'real-life settings' (Claassen, Van Dongen and Timmermans 2015, 11) in which risk governance happens and this clouds the debate on the benefits and drawbacks of risk governance (e.g. Kasperson 2014), which in practice remains largely top-down (Árvai 2014).

In this paper, we analyze how citizens' experiences of a (potentially) risky technology are struc-tured by its risk governance (Rose 1993; Hajer and Wagenaar 2003). To do so we built on the con-cept of the 'discursive resonance' of policy (Bröer 2008; Bröer and Duyvendak 2012; Bröer, De Graaff, Duyvendak and Wester 2016). Discursive resonance means that specific definitions of a problem in policy 'echo' in citizens' experiences of that problem. This occurs when a policy dis-course delineates specific, legitimate ways of framing, feeling and acting on a particular problem and excludes other ways of doing so (Bröer 2008, 93). We do not assume that citizens act irration-ally, purely self-interested or in a 'Not In My Back Yard' (NIMBY) way (cf Esaiasson 2014) when wor-ried about potential health risks. Such assumptions prove to be empirically incorrect in most cases (Verhoeven and Duyvendak 2015, 1). Rather, we trace citizens' experiences to the political process itself. We focus on the varied and relational ways in which citizens over time use framings and manage their feelings about the risks of cell sites (Hochschild 1979, 2003), and consider this in rela-tion to (local) governance practices of cell site deployment as well as citizens' own political action and positioning. Doing so, we follow-up on calls to include emotions in political research (Jasper 2011) and to look beyond negative and protest-oriented citizens (McAdam and Boudet 2012). We assume that citizens can actively engage with 'risk-signals' in policy practice (Kasperson et al. 2003), and through engagement, their experiences can – dialectically – feed back into governance (Eliasoph 1996, 263–286, cf Brown and Olofsson 2014, 429–430).

Design, data and analysis

In our research, we look beyond protesting or concerned citizens since those cases usually result in an interaction with policy discourses. Instead, we start with the attempts by telecom providers and (local) governments to erect cell sites in neighborhoods and we approach citizens who are potentially confronted with these siting practices to be able to see how their (possible) worries are affected by technological risk governance over time. Our multi-level, mixed method and

Table 1. Panels (ªrespondents, response rate).

	Wave 1	Wave 2	Wave 3	Wave 4
Netherlands				
National level (online)	694 (.87)	604 (.88)	511 (.86)	412 (.83)
Case Amersfoort	36 (.13)	28 (.78)	25 (.69)	0
Case Duiven	31 (.13)	20 (.61)	23 (.74)	0
Case Utrecht	15 (.17)	14 (.93)	12 (.8)	0
Case Eindhoven	5 (.33)	5 (1)	2 (.4)	0
Case Egmond Binnen	22 (.21)	15 (.68)	0	0
Case Amstelveen	8 (.21)	7 (.88)	5 (.71)	0
California				
Case Encinitas	16 (.19)	13 (.81)	7 (.44)	0
Case Glendale	15 (.10)	6 (.4)	0	0

ªNumber of respondents and response rate.

longitudinal research design to study the dynamics of citizens' experiences of technological risk is, as far as we are aware, unique (cf Visschers and Siegrist 2012; Conner and Siegrist 2015).

First, we follow citizens' framings and risk perceptions with a representative panel of Dutch citizens between October 2012 and December 2014. This panel was surveyed online and functions as a control for changes at the macro level. At the same time, we use a longitudinal research design that is comparable to 'small number qualitative longitudinal research' (Holland, Thomson and Henderson 2006).

Citizens' experiences over time were observed in mixed-method panel studies in eight cases that included: repeated open interviews, face-to-face surveys and observations (see Table 1). The selection of respondents is based on the proximity of their household to the proposed location of the cell site and, where possible, includes those citizens actively addressed in the siting practices (Utrecht, Eindhoven, Encinitas, Glendale). We have been cautious not to predominantly frame cell site deployment as a health risk ourselves and, following solutions offered by Henwood et al. (2008, 435), were acutely aware of the fact that respondents 'routinely live their lives with no reference to risk at all' (idem). These mixed-method panels are executed in the context of siting processes in the Netherlands (6) and California (2), which we followed ethnographically by conducting interviews, participatory observations and document analysis. The selection of a siting process is based on the opportunity to follow ongoing siting practices. We focus on the (localized) decision-making process and not on the material construction of the cell site. Hence, we selected non-contentious situations 'at risk' for citizens' concerns or protest to emerge. Variation between situations is based on the hypothesis that policy discourse influences citizens' everyday experiences. We search for variation in the siting practices at the level of formal citizen participation in the decision-making process, prompting the inclusion of two cases in California where such participation is ostensibly more common. We thus primarily aim for a comparison of local decision-making processes, and do not claim to make a cross-national comparison of risk governance practice.

Analysis

Citizens' experience is operationalized as discursive practice, particularly framing and feeling. We focus on 'diagnostic framing': how citizens identify a problem and what they attribute to that problem (Benford and Snow 2000, 615). To grasp feelings, we focus on the moments when respondents explicate how they feel through words and through our observations. Our understanding of the relation between framing and feeling coincides with that of Verhoeven & Duyvendak (2015, 5), who embed emotion management within framing practice. We distinguish between three framing practices: a 'categorical' change in framing, when citizens start to use new framings; a 'focus', when citizens emphasize one framing over the other over time; and, a 'multifaceted' change, when citizens emphasize more different framings over time.

Based on interpretive policy analysis (Yanow 2000) and policy discourse analysis (Hajer 2005, 303), we triangulated results to provide an overall interpretation. The qualitative interview data serves as a primary source, with the observational and survey data controlling our interpretation (Creswell and Plano Clark 2007, 75–77). The data management and qualitative analyses are done with the use of Atlas.ti qualitative data analysis software; for the quantitative analyses and descriptive statistics, SPSS is used. To analyze the interviews, first, a 'cross-sectional coding scheme' is developed in a grounded-theory fashion (Charmaz 2006, 42–71). We note framings and feelings, as expressed by the respondents, about cell-site deployment, experiences of cell phone technology, the living environment and local politics. We kept detailed logbooks throughout the fieldwork, which aided in the interpretation. The different sources of data were continuously compared to produce a narrative about a respondent's everyday experience of cell-site deployment over time. In this comparison we could also account for interviewer-effects, of which we found little evidence. This narrative is summarized, per respondent, and standardized with a theoretically constructed 'longitudinal coding scheme'. This second coding scheme focuses on the observed changes in feelings, framings and political practices (protest activities, searching for information, talking with neighbors, etc.). Both coding schemes were developed and validated in joint-coding sessions with the research team (inter-coder reliability: 0.77 agreement). Both coding schemes are available upon request.

Risk governance: depoliticization and medicalization

To search for effects of risk governance, we first describe how cell site deployment is governed and framed. Cell-site deployment presents diverse issues such as land use, property value or aesthetics (Burgess 2004, 184). However, the health risk of the radio-frequent electromagnetic fields (EMF) emitted by cell phone signal transmitters is the core issue of most siting controversies (cf Wiedemann et al. 2013). This is not self-evident, since there are no cases of harm nor evidence of hazard. Still, the fear of cancers and other potential health risks have led to precautionary policies and exposure limits in many countries. This *medicalization* of cell-site deployment can be traced back to the interaction between science and politics about the risk and uncertainty concerning EMF's in the early 1970s (ICNIRP 1996). This still ongoing debate about health issues started among scientists and gained momentum and public relevance through politics and policies that fueled research on health effects and precautionary measures (cf De Graaff, Bröer and Wester 2015).

While we do not deny a genuine interest in health effects among scientists and policy makers, we have argued that these measures are part of an attempt to introduce the technology and contain protests and worries; thus, we speak of *depoliticization* (De Graaff, Bröer, and Wester 2015). Governments take responsibility for commercial interest and technological change and couple this with the protection of public health: cell-sites can be built unless a negative health effect is confirmed to exist. This process means that 'health' has often been the only entry point for citizen opposition to cell sites that triggered similar concerns in many cities and municipalities. To some degree depoliticization failed since protests peaked worldwide between 2000 and 2005 and referred to health risks repeatedly. In a second wave of depoliticization opportunities to protest siting on the grounds of health risks have been narrowed down, for example by restricting local governments to take potential health effects into account.

The intertwined processes of medicalization and depoliticization have led to a certain way of governing cell site deployment. This has been identified before but need to be summarized to see how citizens experiences, on a population level and individually, relate to it (e.g. Burgess 2004, Drake 2011, De Graaff, Bröer, and Wester 2015).

Cell site deployment governance contains three key frames:

1. A clear political choice to *roll-out* the technology. The technology is framed as necessary, inevitable and desirable (remember: this was not evident in the early days of cell phone

technology, just 20 years ago). Political debates are framed as risky to the technology and citizens figure as consumers.
2. After initial protest, combined with scientist reporting risk or uncertainty, cell site policy came to include precautionary health *prevention,* particularly concerning sites and less concerning the phones itself. The roll out is thus medicalized and the search for health risks is institutionalized in research programs. Citizens are framed as a passive population potentially at risk from effects of EMF.
3. Cell site governance to some degree also attends to *design* issues. In a design frame, cell sites are about aesthetics and the environment is framed as being at risk from cell-site design. In this frame, citizens are seen as politically active and involved.

Now we turn to investigate if we can find an echo of these frames among citizens.

Citizens' experiences of cell site deployment

To first gauge developments at the macro level in citizens' concerns we present results from our Dutch national level panel. Our risk perception question was: 'How worried are you about the health effects of cell towers?' (adapted from: van Poll, Breugelmans and Devilee 2011, 82, cf Barnett et al. 2007, 244; Barnett et al. 2008, 531–532). Thus, the focus was on respondents' personal experiences of the health risk on a scale of 1 to 5. The first wave of data from our Dutch national panel in October 2012 shows a mean of 2.75 (SD: 1.01), while 21% of respondents note being 'worried' (4) or 'very worried' (5). This percentage is somewhat lower than is reported in earlier data on Dutch citizens' worries about cell sites (Poll, Breugelmans and Devilee, 2011, 38) and is relatively low in comparison to citizens of other countries (TNS, 2010, 33). Dutch citizens' levels of concerns prove similar to those of US citizens (Wiedemann et al., 2013).

Over time, the mean risk perception score is stable with a mean between 2.7 and 2.8 (Graph 1). Meanwhile, 21–24% of respondents note being 'worried' or 'very worried' throughout the four waves of data collection. This stability deviates from earlier data. Between 2003 and
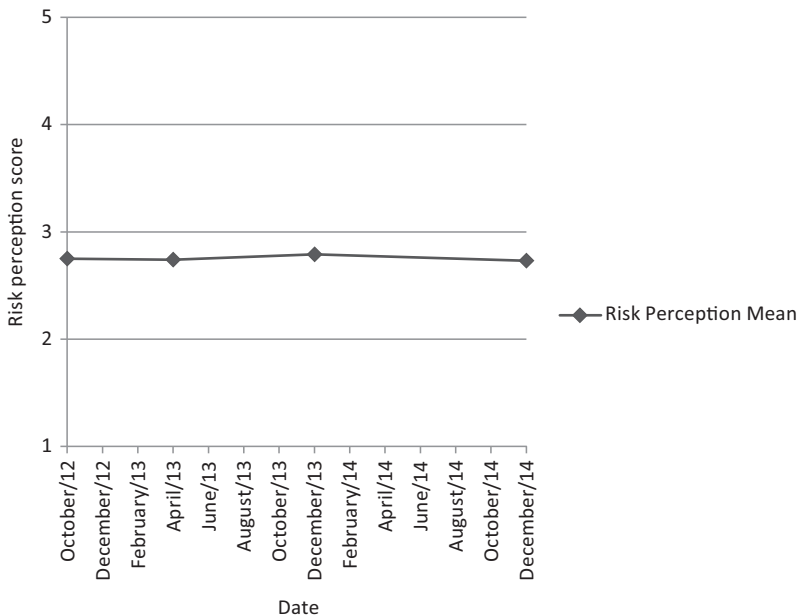
Graph 1. Risk perception mean (NL Data).

2008, the percentage of the population very/moderately worried rose from 20% to 32% (Poll, Breugelmans and Devilee, 2011, 38). Between 2006 and 2010, in a different survey, the percentage of people stating their health is affected 'to a large/some extent' went down from 51% to 47%. (TNS, 2010, Annex 23).

Because of methodological differences, this comparison is not straightforward, but it appears that Dutch citizens' concerns about the health risks of cell sites have, after an increase between 2003 and 2008 and a decrease until 2010, stabilized in more recent years. This stability coincided with the slowing down of the public debate in the Netherlands: between 2000 and 2005, we note a peak in public debate and local conflicts after which no major new debates or conflicts ensued. Moreover, in recent years, very few alarming research findings or other information have appeared.

We now turn to citizens' experiences through the way respondents individually frame, feel about and position themselves towards local cell-site deployment. In the qualitative part of the research we offered respondents maximum room to talk about cell sites. In their utterances we inductively identified five different framings of cell sites: Happy Technology, Health Hazard, Visual Pollutant, Property Value and Democratic Control, which are detailed below. An indication of their frequencies in our local cases can be found in Table 2. This shows that the Health Hazard framing is the most frequently used framing.

The 'Happy Technology' framing constructs a cell site as a functional issue and focuses on the need for better coverage, capacity and quality of the wireless network. The second is a 'Health Hazard' framing. This framing emphasizes the health risks associated with a cell site, especially its possible carcinogenic effect. The third framing is that of a cell site as a 'Visual Pollutant'. The main concern here is the cell site disturbing, for example, the view from one's living room. A fourth framing is that of 'Property Value'; here, a cell site becomes an economic concern, stressing its potential to lower real-estate values. The fifth and final framing is that of 'Democratic Control'; here, the construction of a cell site is a political problem and an issue of due process and trust in decision makers. These inductively constructed frames are similar to what we have found in the predefined survey and partly similar to what is known from earlier studies on the issue.

In all our cases the governance frames resonate among citizens. The Happy Technology framing is consonant with cell site deployment policy discourse that cell phone technology is a necessary collective good (roll-out). The Health Hazard framing is consonant with the policy discourse's medicalization of the technology (prevention). The Visual Pollutant framing is not based on the dominant governance of cell sites in the Netherlands, even though it is generally part of building procedures in the country similar to democratic control as an ongoing issue in local policy making and implementation. In California, visual pollution is a legitimate concern in siting procedures (design). The Property Value framing is only sometimes found in local authorities' framings of a cell siting. We have the impression that Visual Pollutant and Property Value framings stem from earlier protest and policy making on cell sites and high voltage powerlines.

Citizens take different stances towards the local governance and construct different feelings in the context of combinations of frames. Empirically, we identified five positions towards localized siting practices: Distant, Optimistic, In Doubt, Critical and Alarmed. These positions

Table 2. Frequency framings.[a]

	Amersfoort	Duiven	Utrecht	Eindhoven	Egmond	Amstelveen	Encinitas	Total
Happy Technology	25	23	24	35	19	14	17	22
Health Hazard	40	37	31	17	31	34	37	32
Visual Pollutant	20	23	21	38	31	30	32	28
Property Value	3	5	10	1	6	7	7	6
Democratic Cont.	11	12	14	10	13	17	6	12
Total	100	100	100	100	100	100	100	100

[a]Percentages of codes used per interview transcript, because of rounding up of percentages counts do not always add to 100 / Glendale data is not suited for this analysis.

Table 3. Framings of cell sites.

	Feelings	Everyday positions	Position towards policy
Residual	Unaware,	Distant	Unaware or avoiding
Happy Technology, Property Value, Democratic Control	Joy, Satisfaction	Optimistic	Supportive
Health Hazard, Happy Technology	Anxiousness	In Doubt	Ambivalent
Visual Pollutant, Property Value, Democratic Control, Health Hazard	Anger	Critical	Trying to influence
Health Hazard, Democratic Control	Fear, outrage	Alarmed	Trying to influence

range from citizens expressing themselves as being inattentive or indifferent to the problem (Distant) to being very much engaged and concerned (Alarmed) (See Table 3).

Cell-site deployment often is of little importance in citizens' everyday life even though they often have heard about contestation:

> I: Perhaps, to begin with, if I start about cell sites and those antennas, what do you think about?
>
> R: I don't get stressed out right away, so eh [laugh]
>
> I: That's good.
>
> R: I do know that there are people who are immediately stressed out when a cell site is built nearby, but it does not bother me at all.
>
> [Example 1: Respondent 2007,1, Man, 1955, Duiven][1].

In this example, Respondent 2007 frames cell sites as a public issue that does not pertain to him. In so doing, he displays both a familiarity with the debate and a distance between it and his everyday life.

Respondents can also *optimistically* embrace the technology and its benefits and frame the cell sites as a necessary utility:

> R: … it makes good sense that a cell phone company who is in the business of providing a service, that we apparently want, you know, it's not a service that, you know, nobody wants, it's not like dental service [laughing] […] But, anyway, we want this. So … if we want it, and we want convenience, we want it to work, and we want it to work where we need it to work …
>
> [Example 2, Respondent 8005b, 2, Man, 1949, Encinitas].

Respondent 8005B's statement emphasizes the benefits of cell-site deployment and the common 'good sense' of this position. Nonetheless, he is also pointing out inevitability of the roll out.

A *doubtful* stance towards cell-site deployment means that respondents reproduce uncertainty in their accounts

> R: I mean, you know, I don't think I have any ill effects of it, you know, these have been up there for a few years … but … you know … it's not something that you wanna go … you know. I wouldn't stick my head in the microwave everyday …
>
> [Example 3: R8000, 1, Man, 1956, Encinitas].

Respondent 8000 is balancing his personal experiences from already existing antennas with precaution and the repeated use of the phrase 'you know' can be seen as a feature of his unease and inability to take a clear-cut position

Respondents can also take a *critical* position and subtly challenge the policy discourse:

> R: It eh … unfortunately … the eh. because it is so complex, because you can't see it … What you can see is this thing. And so you argue about this thing. And you go, well, you know, if it looked more like this … then … And so we argue about the looks of things.

[Example 4: Respondent 8006,1, Man, 1957, Encinitas].

Respondent 8006 subtly agrees, while reflecting on the decision-making process, with the 'complex' health issue and points out that his concern is not truly with aesthetics.

Lastly, respondents more explicitly challenge the policy discourse when they are *alarmed* about cell site deployment. In these case health risk of cell-site deployment appear to be real and existing.:

> R: I can't prove anything, but my foster son lives near cell sites, and he always suffers from eczema. And that makes me think: I would move! [laugh] I don't know if it would come to that, but I really don't like these things anywhere near me.

[Example 5: Respondent 1003,1, Woman, 1937, Amersfoort].

In short, we can see that citizens' framing and feelings concerning cell sites have a clear political dimension and are geared towards governance.

Changes in citizens' experiences over time

We now turn to citizens' experiences over time. Across our cases, in the expressions of the 121 respondents who participated at least twice in the panel studies, framings remain stable in 87% and changed in 13%. Feelings remained stable in 69% and changed in 31%, both towards more and less concern (see Table 4). The mean risk perception scores of all panels (see Graph 2) are similar to the Dutch population mean and remain relatively stable – except for the Eindhoven case - over time.

Since we expect governance to influence citizens' experience, we now look at local governance and its potential influence on experience in more detail. Particularly, we expected that local governance, as a translation of national governance, influences citizens' experiences.

We find how local authorities take up different positions to citizens' concerns about cell sites. We delineate three positions: First, local authorities can *reject* these concerns, local policies affirm national level practices in favor of roll-out. Second, local authorities can *mediate* between citizens' concerns and interests of other stakeholders. Often aesthetics become important here although as national level practices are generally also affirmed. Third, local authorities can *cooperate* with citizens, legitimizing health worries and challenging national level practices (Bröer, de Graaff, Duyvendak and Wester 2016).

When we talked to citizens and observed their (political) actions, local newspapers, the internet and active neighbors are referred to as the most important sources of information. Respondents mention searching for information individually. More than a quarter of respondents (26%) mention engaging in such activities, but the proportion of respondents doing so differs per situation (See Table 5). Respondents generally learn about alternative framings of, and feelings about, cell-site deployment from active neighbors who protest existing policies. In half of the cases, we encounter such protest, but the absolute number of respondents actively

Table 4. Framing and feeling changes.[a]

	Amersfoort $N=33$	Duiven $N=28$	Utrecht $N=14$	Eindhoven $N=5$	Egmond $N=15$	Amstelveen $N=7$	Encinitas $N=13$	Glendale $N=6$	Mean $(N=121)$
Feeling change	12	21	43	40	20	43	38	33	**31**
More concerned	9	14	7	0	0	0	31	33	**12**
Less concerned	3	4	36	40	7	29	8	0	**16**
Framing change – categorical	9	14	36	0	0	0	31	17	**13**
Framing change – focus	6	11	50	0	7	29	31	0	**17**
Framing change – multifacet	18	14	14	40	0	14	15	0	**14**

[a]Percentages of number of respondents observed at least twice with significant changes, inter-coder reliability: 0,77.
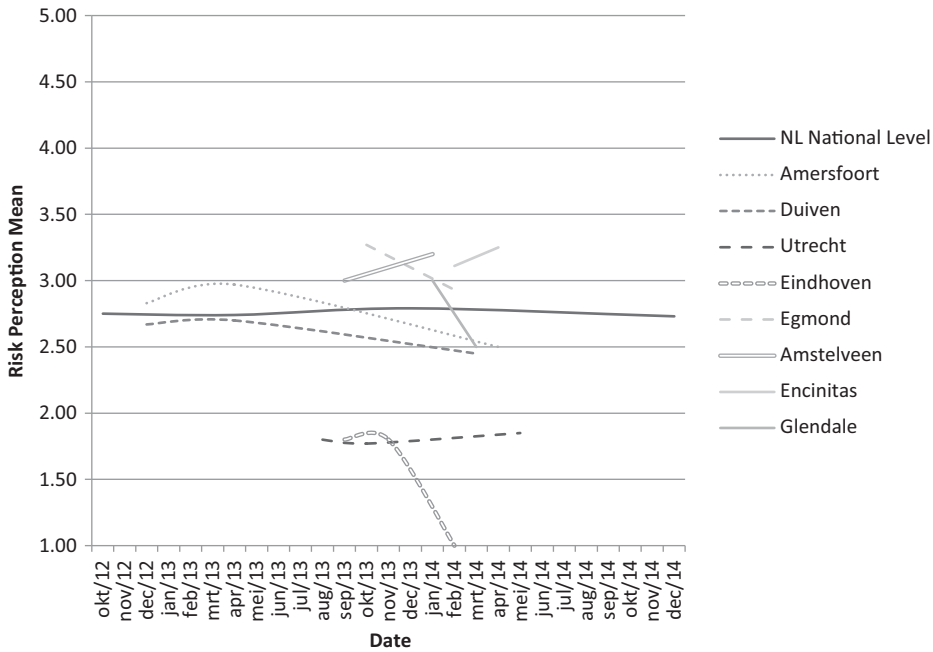
Graph 2. Panels overview October 2012–December 2014: risk perception mean scores.

Table 5. Situations summary.

	Position local authority[a]	Mobilizing[b]	Searching for information[b]	Total N
Amersfoort	Rejecting citizens' concerns	0 (0)	5 (15)	33
Duiven	Rejecting citizens' concerns	0 (0)	12 (43)	28
Utrecht	Co-operating with citizens	0 (0)	3 (21)	14
Eindhoven	Mediating between industry and citizens	0 (0)	0 (0)	5
Egmond Binnen	Mediating between industry and citizens	1 (7)	1 (7)	15
Amstelveen	Rejecting citizens' concerns	1 (14)	2 (29)	7
Encinitas	Mediating between industry and citizens	1 (8)	5 (38)	13
Glendale	Co-operating with citizens	1 (17)	3 (50)	6
Total		4 (3)	31 (26)	121

[a]Position of local authority to citizens' health concerns during time of case-study
[b]N/(Percentages of number of respondents observed at least twice)

protesting ($N = 4$) is small in our sample since we included a cross-section of locals. The emergence of these activities seems to be provoked by local interactions, especially when particular questions on health risks remain unanswered.

Even if local governance does not seem to make much of a difference, we find that local interactions can temporarily increase citizens' concerns when they are left out of the decision-making process ('rejected') (Amersfoort, Duiven). Situations in which citizens have the power to deny cell-site deployment are scarce. However, in two tenant-voting procedures in which residents have veto-power (Utrecht and Eindhoven), we find that residents are more appeased over time, especially so in Eindhoven. This appears to suggest that the existence of formal opportunities to engage both induces the most changes in citizens' positioning and shifts such positions towards increasingly appeased citizens. Local interactions, however, only partly offer an explanation for this. For example, in Encinitas and Glendale, where there is more formal opportunity for meaningful citizen participation, we see more changes in framing and feeling *and* more concern over time. Additionally, when both local authorities and citizens engage

with cell-site deployment, we find that siting practices induce concern when they violate citizens' expectations of what the (local) political decision making should be about (Encinitas). We suspect that local authorities play a pivotal role in defining legitimate stakes but have not been able to discern a similar pattern in these non-contentious situation as we have in cases in which protest developed (Bröer, De Graaff, Duyvendak and Wester 2016).

We observe some engagement and changes in positions. Respondents, for example, focus their framings of cell-site deployment on health, consider the changes between interview 1 and 2 in the following case:

I: Perhaps it is good to start with: If I talk about these cell towers for mobile phones, eh, what do you think about?

R: I have not the faintest idea, I have never, eh, never thought about it, eh, where such a thing is, what it does …

I: And are you …

R: I do hear from a lot of people that they are against it, that they are bothered by it. There's not such a thing close by though, I think.

[Example 8A: Respondent 2013,1, Man, 1962, Duiven].

I: If I start about these cell towers, what kind of associations do you have with them?

R: Yeah, especially radiation.

I: And also other things?

R: No.

I: Ok, so could you perhaps say something about possible advantages and disadvantages of a cell tower?

R: Well, look, if there would be no radiation, they could easily put it here, on that school. I wouldn't notice that and wouldn't think it's a problem.

[Example 8B: Respondent 2013,2, Man, 1962, Duiven].

In Example 8A, Respondent 2013 initially seems to take a distant position, but he is aware of the Health Hazard framing that others use. In Example 8B, his use of the Health Hazard framing is much more pronounced, for example in his repetition of the word 'radiation', but also in the way he now appears to apply the Health Hazard framing to his own situation ('here, on that school'). These changes are short lived, for example in this case:

R: … my interest is, all of a sudden, very much … stirred because this cell site is coming here … I think … ah. You see, I am missing things, so I will look into it, ask around in the neighborhood, like, did you hear anything? I am more curious now.

[Example 9A: Respondent 2107,2, Woman, 1953, Duiven].

I: I am curious if something has been going on in Duiven since [last visit]?

R: Well, I will answer that very honestly; I wouldn't know … And why not? Because I simply did not keep track of it [cell site], I did not look into it anymore [laugh].

[Example 9B, Respondent 2107,3, Woman, 1953, Duiven].

Respondent 2107 mentions becoming 'stirred' by the cell-site deployment, at the end of her second interview (Example 9A). She explains that she became more curious and would gather more information. At the start of her third interview (Example 9B), she immediately admits that she did not follow through with her intention, although she suggests that she should have done so.

The effect of local politics does not only rest on informing or mobilizing citizens but also in preventing mobilization. We found two general patterns which inhibit citizens' participation: The first is *de-synchronization*. Siting processes lack clear synchronization between the moments of decision making, citizen participation in that decision and the physical construction of the cell site. In all of our cases the construction of the site was either postponed or happened long after the formal decision had been made. The second is *repetition*. Industry representatives have the flexibility to repeatedly attempt to find a suitable site within the same area, potentially exhausting citizens' and local authorities' engagement. Siting processes are often very lengthy, often on purpose. These dynamics make it difficult, though not impossible, for citizens to interact with cell-site deployment in the first place as they slow down active engagement and depoliticize the process.

The lack of salience, concerns and actions has also more mundane causes. On an individual level, citizens' positions towards cell-site deployment are embedded in many more and often more important concerns than cell-site deployment: work, raising children, illnesses; in citizens lives, many issues vie for attention. Regarding cell-site deployment, citizens mobilize existing emotional attachments to make sense of a site. The most notable attachments respondents refer to are to place and community, local politics and the technology itself. Such attachments are well-known (e.g. Masuda and Garvin 2006). Respondents who, for example, voice their attachment to the neighborhood as transient also show a disinterest the cell site:

> R: […] And … so we're here, for so long as we're here. Well, so for me, if I don't like something that's going on in the neighborhood. […] I would just go somewhere else, literally go somewhere else …

> [Example 10, Respondent 9002,2, Man, 1956, Glendale].

These attachments underscore in particular how citizens' lives are 'temporally bounded' differently than (industry) policy making (Polletta 2014, 464). For example, citizens refer to feeling connected to or disconnected from their neighborhood as place or community. This attachment builds up over an extensive period of time and involves a consideration of one's history and future in that neighborhood (Tavory and Eliasoph 2013). Such considerations can involve a long-term 'trajectory' (Tavory and Eliasoph 2013, 913–916). The experience of the risks of a specific cell site is also influenced by these different considerations of time and expectations of the future (cf Brown and de Graaf 2013).

Finally, even if citizens appear distant or unmoved, this is repeatedly an achievement rather than apathy. Take a look at the following example, where potential health risks of electromagnetic fields are discussed.

> I: And, you mention headaches, sleep issues. Did you look into that?

> R: Hmm, No, I actually did not, eh. Why I do not do that, yeah, to a certain extent it's somewhat a far from my bed show, the moment I learn [a cell tower] is built in the street or very close by …

> I: Hmm …

> R: … then I would start to want to learn more …

> [Example 7: Respondent 2011, 3, Woman, 1978, Duiven].

In this example, Respondent 2011 actively defends why she did not invest herself in the issue. The Dutch euphemism, 'far from my bed show', which originates from the title of a television program that ran through the 1980s, denotes a lack of salience of a particular, usually political, issue for one's personal circumstances. By using this euphemism in her third interview, she frames cell-site deployment as a health issue, while she simultaneously legitimates her lack of engagement with cell-site deployment. Through such discursive action, respondents prevent the siting practices from impacting their everyday lives and actively maintain their positions towards it.

The long shadow of risk governance

The debate on the health risks of cell-site deployment is now about three decades old (Burgess 2004, 7). Even if no risks have been demonstrated so far, health worries remain and protests continue to some degree. This, we argue, is the cultural effect of decades of risk governance: over time, the governance of cell sites has produced both stabile and moderate concerns. Citizens are indeed neither irrational nor purely self-interested (cf Esaiasson 2014). Rather, we trace their positions to the political process itself, which has settled into taken for granted assumptions and positions concerning a technology that is only a quarter of a century old.

This research answers to the call for researching real life settings of risk governance (e.g. Wiedemann et al. 2013, Claassen, Van Dongen and Timmermans 2015, 11) to understand its benefits and drawbacks (e.g. Kasperson 2014). Our longitudinal and comparative mixed-methods research design, that has emphasized non-contentious situations 'at risk' for citizen protest to emerge, shows that the way in which citizens experience cell phone antenna siting is clearly in line with governance practices that stress the roll out of the network and a precautionary approach to the health risks and design issues. Over time we find how in general citizens' concerns remain stable and citizens continue to frame the issue most prominently as an uncertain health risk that is not directly relevant to them. This stability, like the framing, is line with cell site governance, which has stabilized the lasts ten years. The fact that almost a quarter of (Dutch) citizens report health worries is the long shadow of a public debate the started in the 1990s and originated in professional and policy discourse in the 1970s. A dominant pro-technology governance is coupled to health risk prevention as secondary goal, which is reflected in the framings and feelings among citizens. In particular, citizens' ongoing concerns for cell site deployment can for a large part be explained by the ongoing medicalization in risk governance practices.

The echo of risk governance is slightly moderated locally. However, different from local protests (Bröer, de Graaff, Duyvendak and Wester 2016), citizens' everyday experiences are by and large not responding to the specificities of local governance. In particular situations though, such as ones in which citizens and local politicians co-operate, the political engagement of some citizens can co-constitute what is legitimate to do, say and feel about a social problem (cf Eliasoph and Lichterman 2003). Moreover, citizens have diverse and often strong existing emotional attachments that moderate their experience of local cell site deployment. Citizens' positions towards cell sites depend, for example, on their experiences *of* time, change *over* time and are 'temporally bounded' (Polletta 2014, 464).

Our claim that governance practices structure citizens' experience of uncertain technological risk, therefore, cannot be fully substantiated. Although the many mundane and sometimes heated interactions between citizens, industry professionals and policymakers are relevant to citizens, citizens' experiences of the potential risks of a technology also results from existing emotional attachments and expectations. Policy practices can provide a context for these experiences depending on the specific situation and citizens' degree of engaging with policy practices. The stability of citizens' experience and the lack of salience of the issue are, upon closer inspection, in part an effect of depoliticization and an accomplishment of citizens actively disengaging from politics. In the case of

cell-site deployment, this interaction appears to have led to a still tense but temporarily stable policy discourse and similarly stabilized citizen experiences of this technological development.

Discussion

The depoliticization of the uncertain risks of cell site deployment seems solidified through most citizens' lack of concern and avoidance of cell-site deployment as a problem. The stability in citizens' concerns is in line with other longitudinal risk research findings on technological risks (Conner and Siegrist 2015). However, concerns about EMF are, in part, kept alive by the paradoxical message in governance practices focusing on the need for technology (roll out), and its possible health dangers (prevention). A significant proportion of citizens remains concerned and the health issue continues to surface. The repeated calls for deliberation and citizen participation in EMF risk governance appear moot when citizens' health concerns on EMF are again feared and avoided by policy makers as new EMF technology emerges (Hess 2014).

We show how the experience of uncertain risks is no effect of an overall 'risk society', but rather of localized interactions through which citizens' experience of uncertain technological risk emerge and shift over time. Risk governance can be a structuring force in citizens' experiences of technological development, but the specific risks and uncertainties coupled with a technology like cell sites are the outcomes of intense and reflexive social and political interactions and are not pre-given and objective. Moreover, the relation between risk governance practice and citizens' concerns might most productively be considered as a dialectical relation (Brown and Olofsson 2014). Whereas citizens' experiences emerge in interaction with risk governance, just so does risk governance emerge in interaction with wider social-political contexts in which citizens can play a key-role (Wardman and Löfstedt 2018). We have highlighted in this article the effect of governance on experience. Elsewhere, we have shown how certain citizens and action groups are able to influence (local) governance creating feedback loops (De Graaff 2016). These observations emphasize the need to further examine the dynamics of risk policy making and we would argue that in doing so it is particularly relevant to examine how risk governance influences citizens' experiences of risk and uncertainty and how, in turn, this affects the nature and course of ensuing public concerns and conflicts. To grasp these interactions the use of mixed-methods and, in particular, a longitudinal orientation appear pivotal.

Our observations also point, more practically, to the need to move away from goal-oriented, expert-centered and linear approaches to health risk governance (Árvai 2014) and citizens' engagement in these practices (cf Arnstein 1969; Few et al. 2007). It is hard – and perhaps unnecessary – to build generic risk governance practices (cf De Vries, Verhoeven and Boeckhout 2011). Instead, alternative ways of governing this technological development and its risks might be appropriate. Controversies such as these need outside involvement for closure (Marres 2007, 772). The opportunities for such involvement are lacking in most cell-site deployment governance. This involvement entails more than the need for citizen participation or the need to acknowledge the inevitable uncertainties of technological innovation and science's limited capabilities to deal with these definitively (Jasanoff 2007; cf Van Dijk et al. 2011). Such involvement also entails actively engaging with, instead of avoiding, conflict and controversy (Fischhoff 1995) in a 'bold and modest' way (Bijker 2017). In so doing, controversy, and the framings and feelings of not only citizens but all actors involved in governing an uncertain risk, should be explored and engaged with.

Note

1. All quotes are translated, when needed, to English by the first author. We provide the individual's respondent number (2007), the wave in which the interview was conducted (1), respondent's sex (Man), year of birth (1955) and the location of the interview (Duiven).

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References

AD. 2018. "Straling antennes aan banden: onduidelijkheid over gevaar volksgezondheid [Radiation antennas limited: uncertainty about danger to public health]". *Algemeen Dagblad*. March 27th. https://www.ad.nl/politiek/straling-antennes-aan-banden-onduidelijkheid-over-gevaar-volksgezondheid∼a388a34d/

Arnstein, S. R. 1969. "A Ladder of Citizen Participation." *Journal of the American Institute of Planners* 35: 216–224.

Árvai, J. 2014. "The End of Risk Communication as we Know it." *Journal of Risk Research* 17 (10): 1245–1249.

Barnett, J., L. Timotijevic, R. Sheperd, and V. Senior. 2007. "Public Responses to Precautionary Information from the Department of Health (UK) About Possible Health Risks from Mobile Phones." *Health Policy* 82 (2): 240–250.

Barnett, J., L. Timotijevic, M. Vassallo, and R. Sheperd. 2008. "Precautionary Advice About Mobile Phones: Public Understandings and Intended Responses." *Journal of Risk Research* 11 (4): 525–540.

Benford, R. D., and D. A. Snow. 2000. "Framing Processes and Social Movements: An Overview and Assessment." *Annual Review of Sociology* 26: 611–639.

Bijker, W. 2017. "Constructing Worlds: Reflections on Science, Technology and Democracy (and a Plea for Bold Modesty)." *Engaging Science, Technology, and Society* 3: 315–331.

Boholm, A., and H. Corvellec. 2011. "A Relational Theory of Risk." *Journal of Risk Research* 14 (2): 175–190.

Boholm, A., H. Corvellec, and M. Karlsson. 2012. "The Practice of Risk Governance: Lessons from the Field." *Journal of Risk Research* 15 (1): 1–20.

Bröer, C. 2008. "Private Trouble, Policy Issue, How Policy Discourses Shape Our Experience of Aircraft Sound." *Critical Policy Studies* 2 (2): 93–117.

Bröer, C., and J. W. Duyvendak. 2012. "Sensing and Seizing Opportunities." In *Contention in context*, edited by J. Jasper, 241–255, Stanford, CA: Stanford University Press.

Bröer, C., M. B. de Graaff, J. W. Duyvendak, and R. A. Wester. 2016. "Engaging Citizens: Local Interactions, Policy Discourse and Courses of Protest Against Mobile Phone Cell Site Deployment." *European Journal for Cultural and Political Sociology* 3 (4): 447–468. doi: 10.1080/23254823.2016.1201427.

Brown, P., and S. de Graaf. 2013. "Considering a Future Which May Not Exist: The Construction of Time and Expectations Amidst Advanced-Stage Cancer." *Health, Risk & Society* 15: 543–560.

Brown, P., and A. Olofsson. 2014. "Risk, Uncertainty and Policy: Towards a Social-Dialectical Understanding." *Journal of Risk Research* 17 (4): 425–434.

Burgess, A. 2004. *Cellular Phones, Public Fears, and a Culture of Precaution*. New York: Cambridge University Press.

Charmaz, K. 2006. *Constructing Grounded Theory - A Practical Guide Through Qualitative Analysis*. London: Sage.

Claassen, L., D. van Dongen, and D. R. M. Timmermans. 2015. "Improving Lay Understanding of Exposure to Electromagnetic Fields; The Effect of Information on Perception of and Responses to Risk." *Journal of Risk Research*. 20(9): 1151–1131. doi: 10.1080/13669877.2015.1031268.

Conner, M., and M. Siegrist. 2015. "The Stability of Risk and Benefit Perceptions: A Longitudinal Study of Assessing the Perception of Biotechnology." *Journal of Risk Research*. 19 (4): 461–475. doi: 10.1080/13669877.2014.988169.

Creswell, J. W., and V. L. Plano Clark. 2007. *Designing and Conducting Mixed Methods Research*. Thousand Oaks, London, New Delhi: Sage Publications.

de Graaff, M. B. 2016. "Should I be Worried? Citizens' Experiences and the Risk Politics of Cell Site Deployment." PhD thesis, Amsterdam Institute for Social Science Research, University of Amsterdam, the Netherlands. Available at: http://hdl.handle.net/11245/1.535001

de Graaff, M. B., C. Bröer, and R. A. Wester 2015. "Biomedical Risks and Citizenship: Depoliticizing Cell Site Deployment in the Netherlands and Southern California." *Journal of Risk Research* 20 (9): 1195–1210. doi: 10.1080/13669877.2015.1071864.

Drake, F. 2011. "Protesting Mobile Phone Masts: Risk, Neoliberalism, and Governmentality." *Science, Technology & Human Values* 36 (4), 522–548.

Dijk, H. F. G., E. van Rongen, G. Eggermont, E. Lebret, W. E. Bijker, and D. R. M. Timmermans. 2011. "The Role of Scientific Advisory Bodies in Precaution-Based Risk Governance Illustrated with the Use of Uncertain Health Effects of Electromagnetic Fields." *Journal of Risk Research* 14 (4): 451–466.

Eliasoph, N. 1996. "Making A Fragile Public: A Talk-Centered Study of Citizenship and Power". *Sociological Theory* 14 (3): 262–289.

Eliasoph, N., and P. Lichterman. 2003. "Culture in Interaction." *American Journal of Sociology* 108 (4): 735–794.

Esaiasson, P. 2014. "NIMBYism - A Re-Examination of the Phenomenon." *Social Science Research* 48: 185–195.

Few, R., K. Brown, and E. L. Tompkins. 2007. "Public Participation and Climate Change Adaptation: Avoiding the Illusion of Inclusion." *Climate policy* 7: 46–59.

Fischhoff, B. 1995. "Risk Perception and Communication Unplugged: Twenty Years of Process." *Risk Analysis* 15 (2): 137–145.

Hajer, M. 2005. "Coalitions, Practices and Meaning in Environmental Politics: From Acid Rain to BSE." In *Discourse Theory in European Politics: Identity, Policy, and Governance*, edited by D. R. Howarth and J. Torfing, 297–315. Houndmills, Basingstoke, Hampshire: New York, Palgrave Macmillan.

Hajer, M., and H. Wagenaar, eds. 2003. *Deliberative Policy Analysis - Understanding Governance in the Network Society*. Cambridge: Cambridge University Press.

Henwood, K., N. Pidgeon, S. Sarre, P. Simmons, and N. Smith. 2008. "Risk, Framing and Everyday Life: Epistemological and Methodological Reflections from Socio-Cultural Projects." *Health, Risk & Society* 10 (5): 421–438.

Hermans, M. 2014. "Engaging with Risks: Citizens, Science and Policy in Mobile Phone Mast Siting Controversies." PhD thesis, Maastricht University, Maastricht, The Netherlands.

Hess, D. J. 2014. "Smart Meters and Public Acceptance: Comparative Analysis and Governance Implications." *Health, Risk & Society* 16 (3): 243–258. doi: 10.1080/13698575.2014.911821.

Hochschild, A. R. 1979. "Emotion Work, Feeling Rules, and Social Structure." *American Journal of Sociology* 85 (3): 551–575.

Hochschild, A. R. 2003. *The Commercialization of Intimate Life: Notes from Home and Work*. Berkeley and Los Angeles: University of California Press.

Holland, J., R. Thomson, and S. Henderson. 2006. "Qualitative Longitudinal Research: A Discussion Paper." *Families & Social Capital ESRC Research Group, Working Paper 21*. London: London South Bank University.

ICNIRP. 1996. "International Commission on Non-Ionizing Radiation Protection Statement on Health Issues Related to the Use of Hand-Held Radiotelephones and Base Transmitters." *Health Physics* 70 (4): 383–387.

Interphone Study Group. 2010. "Brain Tumour Risk in Relation to Mobile Telephone Use: Results of the INTERPHONE International Case-Control Study." *International Journal of Epidemiology*, 39: 675–694. doi: 10.1093/ije/dyq079

Jasanoff, S. 2007. "Technologies of Humility." *Nature* 450: 33.

Jasper, J. M. 2011. "Emotions and Social Movements: Twenty Years of Theory and Research." *Annual Review of Sociology* 37: 14.1–14.9. doi: 10.1146/annurev-soc-081309-150015.

Kasperson, J. X., R. E. Kasperson, N. Pidgeon, and P. Slovic. 2003. "The Social Amplification of Risk: Assessing Fifteen Years of Research and Theory." In *The Social Amplification of Risk*, edited by N. Pidgeon, R. E. Kasperson, and P. Slovic, 13–46. Cambridge: Cambridge University Press.

Kasperson, R. E. 2014. "Four Questions for Risk Communication." *Journal of Risk Research* 17 (10): 1233–1239. doi: 10.1080/13669877.2014.900207.

Katz, J., ed. 2008. *Handbook of Mobile Communication Studies*. Cambridge, MA and London, UK: The MIT Press.

Marres, N. 2007. "The Issues Deserve More Credit: Pragmatist Contributions to the Study of Public Involvement in Controversy." *Social Studies of Science* 37 (5): 759–780.

Masuda, J. R., and T. Garvin. 2006. "Place, Culture, and the Social Amplification of Risk." *Risk Analysis* 26 (2): 437–454.

McAdam, D., and H. S. Boudet. 2012. *Putting Social Movements in their Place: Explaining Opposition to Energy Projects in the United States, 2000-2005*. Cambridge: Cambridge University Press.

Polletta, F. 2014. "Is Participation Without Power Good Enough? Introduction to 'Democracy Now: Ethnographies of Contemporary Participation'." *The Sociological Quarterly* 55: 453–466.

Rose, N. 1993. "Government, Authority and Expertise in Advanced Liberalism." *Economy and Society* 223: 283–299.

SCENHIR. 2015. "Opinion on Potential health effects of exposure to electromagnetic fields (EMF)." *European Commission - Scientific Committee on Emerging and Newly Identified Health Risk*. Adopted January 27th 2015. doi: 10.2772/75635

Tavory, I., and N. Eliasoph. 2013. "Coordinating Futures: Toward A Theory of Anticipation." *American Journal of Sociology* 118 (4): 908–942.

TNS. 2010. Electromagnetic Fields. Special Eurobarometer 347, Wave 73.3, TNS Opinion & Social, European Commission, June 2010.

van Poll, H. F. P. M., O. R. P. Breugelmans, and J. L. A. Devilee. 2011. "Hinder, bezorgdheid en woontevredenheid in Nederland – Inventarisatie Verstoringen 2008." *RIVM Rapport*. 630741001/2011. https://rivm.openrepository.com/rivm/bitstream/10029/258593/3/630741001.pdf

Verhoeven, I., and J. W. Duyvendak. 2015. "Enter Emotions: Appealing to Anxiety and Anger in a Process of Municipal Amalgamation." *Critical Policy Studies* 10: 468–485. doi: 10.1080/19460171.2015.1032990.

Visschers, V. H. M., and M. Siegrist. 2012. "How a Nuclear Power Plant Accident Influences Acceptance of Nuclear Power: Results of a Longitudinal Study Before and After the Fukushima Disaster." *Risk Analysis* 33 (2): 333–347.

Wajcman, J. 2008. "Life in the Fast Lane? Towards a Sociology of Technology and Time." *The British Journal of Sociology* 59 (1): 59.

Wardman, J. K., and R. Löfstedt. 2018. "Anticipating or Accomodating to Public Concern? Risk Amplification and the Politics of Precaution Reexamined." *Risk Analysis*. Online. doi: 10.1111/risa.12997.

Waring, J. 2017. "Blog: How Many Global Base Stations are There Anyway?" Mobile World Live, September 1st 2017. Available at: https://www.mobileworldlive.com/blog/blog-global-base-station-count-7m-or-4-times-higher/

Wiedemann, P. M., H. Schuetz, F. Boerner, M. Clauberg, R. Croft, R. Shukla, T. Kikkawa, R. Kemp, J. M. Gutteling, B. de Villiers, et al. 2013. "When Precaution Creates Misunderstandings: The Unintended Effects of Precautionary Information on Perceived Risks, the EMF Case." *Risk Analysis* 33 (10): 1788–1801. doi: 10.1111/risa.12034.

Yanow, D. 2000. *Conducting Interpretive Policy Analysis*. Thousand Oaks, California: Sage Publications.