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COMMUNICATING INVASION: UNDERSTANDING SOCIAL ANXIETIES AROUND MOBILE SPECIES

by
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ABSTRACT. This article explores how discourses of threat concerning invasive alien species emerge and how ordinary citizens understand, receive and appropriate them. It explores the ambivalence of scientists and policy-makers using emotive or highly charged terms and vocabulary, arguing that many make strategic yet cautious use of fear to raise awareness. Based both on in-depth interviews of scientists and/or expert policy-makers involved in communicating with the public about invasive species, as well as citizen focus groups, it further discusses how individuals reflect critically on the terms used in written documents. We argue that the various scientific uncertainties concerning the impacts of invasive species foster and feed other domains of social anxiety beyond the usual concern previous research has shown for xenophobic connotations. These include wider fears about environmental technology, science and expertise, changing environments, and threats to human health.

Keywords: invasive species, social anxiety, focus groups, xenophobic terms, reception, uncertainty

Introduction

In any given summer, during the so-called silly season, newspapers frequently run stories on invasive plant and animal species. When news is thin on the ground, the topic of biological invasions appears to offer the perfect storm: the possibility of snappy by-lines, using evocative and emotional language, and endless possibilities for coming up with creative puns, all in the guise of informing the public about an environmental threat.

How this topic is presented in the popular press appears to vary little, even if the popularity and prevalence of the topic wavers in various contexts. These examples of belligerent titles illustrate how this issue has been presented in three European countries:

'La France commence à traquer ses envahisseurs', *Le Monde* (Morin 2001a).¹

'Genève résiste à l'ambrosie, ce fléau qui envahit l'Europe', *Tribune de Genève* (Zumbach 2013).²

'War of the ants intensifies as Asian species take on Argentines across U.S.', *Daily Mail* (Williams 2013).

The vocabulary voluntarily plays on words connoting attacks, defence and invasions, all part of a militaristic lexicon. Other headlines emphasize the global dimension of the issue and the foreign origin of the plants:

'La diversité du vivant menacée par la mondialisation', *Le Monde* (Morin 2001b).³



Figure 1. 'Nuisance species. Mobilization against Japanese invader'. Newspaper stand in Geneva, 6 August 2013. Photo by authors.

‘Plus de 10 000 espèces exotiques mettent en danger la biodiversité européenne’, *Le Monde* (Caramel 2008).⁴

Lastly, some of them focus on the toxicity of the species involved:

‘Des plantes toxiques arrachées en Haute-Savoie’, *Le Dauphiné* (Corbex 2010).⁵

Terms evoking threats, danger, toxicity and the need for caution abound. Unwanted migrants should be kept at bay. This highly charged use of language has been much discussed by social scientists and repeatedly unpicked and flagged as problematic (see Fall 2013 for a review; Larson *et al.* 2005; Warren 2007, 2008; Head and Atchison 2008; Richardson *et al.* 2008; Fall and Matthey 2011). Tempers have flared on all sides, with accusations of xenophobia making cross-disciplinary debate difficult (see e.g. Gröning and Wolschke-Bulmahn 2003 about suggested links between native plant enthusiasts and Nazi history; and the strong response by Uekötter 2007), and debates have often appeared particularly fervent, such as the recent exchanges in *Nature* and *Science* signed by hundreds of scientists (Robbins and Moore 2013). In this article, we explore not only how such discourses emerge, but rather also specifically how non-specialist citizens receive and understand them. Popular articles about invasive species come in many forms: some simply aim to entertain, while others appear to use specific words to enrol such ordinary citizens and gardeners into local eradication campaigns. Understanding how such widely different discourses are actually understood, and possibly appropriated, seems crucial.

Yet, despite a substantial generalist literature on media and discourse reception (see e.g. Hall 1974; Morley 1980; Staiger 2005), this issue has been examined surprisingly little by scholars working on invasive species. Qvenild *et al.* (2014) stand as a relative exception, with their analysis of the engagement of amateur gardeners with categories of ‘alien’, ‘native’ and ‘invasive’ plants. Yet, even though they are interested in the reception of these concepts, they do not conceptualize the role of the media in their circulation. This literature gap is particularly interesting in the light of recent suggestions in the UK of criminalizing lack of action against specific species on private lands (Withnall 2014): if citizens are to be prosecuted for not taking action, then understanding how they take on board information relating to such

issues is crucial. It perhaps needs stating at the outset that our perspective here is not, as some of our interview partners might have hoped, to find ways of communicating the threat of invasion more effectively. Instead, by exploring how ordinary citizens read and interpret specific types of texts, we are interested in understanding how the use of emotive language plays and paradoxically also fosters new forms of social anxieties (Jackson and Everts 2010), in a context where novel ecologies appear inevitable, in what has been called the Anthropocene – ‘the metaphorical term assigned most famously to the current geological epoch ... in which human activities have come to have significant global impact’ (Robbins and Moore 2013, p. 5).

In order to explore the topic of anxiety further, and specifically its strategic use as a mobilizing force that is diversely appropriated, we will proceed cautiously in two stages. First, we suggest exploring, based on in-depth interviews of scientists and/or expert policy-makers involved in communicating with the public about invasive species, what specific terms and turns of phrase were used, and how and why this was seen as necessary or useful by our interview partners. In this first section, we show that these scientists and policy-makers were clearly ambivalent about the need to play upon what they identified as social anxieties: they seemed to perceive emotion as a useful tool to encourage people to take action while remaining aware of some of its pitfalls.

In the second part of the article, we discuss how the ability to reflect critically on this vocabulary was widespread, drawing on results from a number of citizen focus groups. We had not expected that the various scientific uncertainties around the invasion phenomenon would appear to foster and feed other domains of social anxiety. Resulting concerns were not confined to the issue of problematic species, but instead appeared to snowball or bleed into wider fears about environmental technology, science and expertise, changing environments, and other threats to human health. This is important because most social science critique has, up until now, almost exclusively focused on the risk of feeding xenophobic discourses about uncontrolled human migration and the right to remain, rather than the question of scientific uncertainty (Fall 2013; Robbins and Moore 2013).

In the uncertain globalized world that transpired from our group discussions, not only could plants and animals no longer be trusted to stay in their place, but scientists and experts equally could not

be trusted to continue to perform their assigned social role of providing value-free and clear-cut knowledge. As Takacs (1996) has shown for the field of conservation biology and biodiversity loss, scientists who willingly mobilize emotions and norms, and enter the realm of politics out of personal conviction, risk much in appearing no longer above the fray. That this ability to be morally neutral is, at best, a caricature of how science actually functions in the realm of policy is irrelevant: what mattered here was that the wider respective social roles expected of both scientists and journalists appeared muddied by the use and abuse of specific rhetoric, leading to widespread and anxiety-ridden loss of points of reference about environmental health in general. If this is confirmed in other cases of communication around invasive species, we might cautiously suggest that this might paradoxically lead to less, not more, local action against the spread of invasive species as citizens either simply shy away from what appear to be a controversial, uncertain paths of action, or else suffer from forms of disaster fatigue.

Anxiety, uncertainty, and the public

Following Jackson and Everts (2010), we consider anxiety not only as an individual pathology but also as a social condition that can be institutionalized in order to produce social change. Defined as a feeling of destabilization of one's system of meaning and action and a recognition of one's own mortality, the feeling of anxiety can indeed be strategically deployed by certain actors. Geographies of anxiety can thus be researched, understanding where anxieties occur, how they develop, who they involve and how they are dealt with (Jackson and Everts 2010, p. 2797). Concerning our topic of plant invasion, recognizing that the spread of anxiety depends on the framing of the issue and how it is communicated calls for more consideration regarding how the issue is framed by experts. To date, as we have indicated, there have been many critiques of the belligerent, even xenophobic lexicon used but – to our knowledge – no research on how experts actually negotiate the framing and communication of the issue, choosing to use or not to use controversial terms.

Furthermore, social anxieties can result from many types of discourses, but one key source of anxiety seems to be the notion of risk. For instance, Jackson and Everts (2010) show how, in the case of H5N1, the framing implied that more or less everyone in the world could become ill with the disease.

It implied that all citizens should realize that they were at risk of becoming victims of the pandemic. In this vein, Hier (2003) notes that sites of social anxiety often converge with discourses of risk – for instance, in this case, the risk of catching a disease. Ungar (2001) considers likewise that social anxiety is often a response to uncertainty and ambivalence. Milne *et al.* (2011) suggest furthermore that the rise of political, economic and cultural discourses around fear, worry, unease and anxiety must incite scholars to examine sociologically this affective turn. They further suggest that this is evidence of the wider neglect of emotion and affect in social science research (although see Davidson *et al.* 2012 for signs this is changing).

Uncertainty – which, as we argue, appears central to the reception of communication on invasive plants by the wider public – can refer to two different realities: one relates to the feeling of insecurity about one's own knowledge or the state of knowledge in general, the other to the experience of assessing the probability of an event (Brashers 2001). Even though uncertainty can have different effects, a large part of the literature on uncertainty communication has focused on the close link between uncertainty and anxiety. Brashers (2001) considers this an unnecessarily narrow conception and calls for more consideration of the different kinds of emotional responses to uncertainty. Yet to date, as Frewer *et al.* (2003) argue, there has only been limited research on how uncertainty is received by the public. The few existing studies on this issue have tended to show that the reception of uncertainty can be manifold; yet the public response seems to depend on the hazard being discussed (Miles and Frewer 2003), the source of information (Frewer *et al.* 1998) and the status of the people researched. Frewer *et al.* (2003, p. 78) call for a more precise analysis of 'both the beliefs and representations of communicators about recipient groups, as well as assess[ment of] the beliefs and representations of recipient groups themselves'. In other words, understanding how a discourse works requires both analysing how it is framed and how it is received. This is what we turn to now.

Feeding anxiety – the only way forward?

The first objective of our research is to understand how the issue of plant invasion is brought to the attention of the public sphere and why; and to assess the role of the production of social anxieties in this process.

Methodology: producing and receiving expertise

In this study, we are interested in understanding how species were selected and designated as invasive by a range of experts, how the problem was framed politically, and how experts and local policy-makers decided to communicate this issue. To achieve this, 13 interviews were conducted with local specialists and experts, in the Geneva region in Switzerland, in the Spring of 2010, by one of the authors (Juliet Fall) and a postdoctoral research assistant (Irène Hirt), as part of a project funded by the Fondation Boninchi. Interviews were conducted in French and individuals are quoted here translated into English, at times literally, to best reproduce the terms and turns of phrase used. The Canton of Geneva is an interesting case study, as the first action groups against specific species date back to the end of the 1990s when weed scientists, biologists, allergy specialists and meteorologists coalesced around the issue of ragweed, a highly allergenic species from North America. It was thus possible to interview a number of key people involved in the first stages of raising awareness of the issue on a regional level. Step by step, over about fifteen years and in connection to a global context of increasing focus on the issue of invasive species, the increased focus on biosecurity and control led to the first drafting of *Black Lists* and *Watch Lists* of plant species at a national level and substantial legislative changes on both local and federal levels (see Fall and Matthey 2011). While a number of information sessions and brochures have been produced since then by public bodies and conservation groups to raise awareness in Geneva, it is safe to say that once the immediate threats to health posed by ragweed appeared to be under control, invasive species were no longer identified as a pressing environmental problem by the general public.⁶

Framing social anxieties

One of the main concerns of the experts that we interviewed related to getting local people involved so that they would recognize invasive plants in their gardens and beyond, and either remove them themselves or inform the relevant authorities. There was a widely shared belief amongst professionals that local citizens could be enrolled into what was presented as a global struggle with local impacts:

Well if everyone is aware, maybe they will take over, maybe they will go to a garden-centre and say ‘wait, why do you sell buddleia, don’t you

know that buddleia is invasive?’, so they will finally take responsibility. So it really needs to work at all levels, in order to have a clear impact. (T4,⁷ biologist, 5 May 2010)

In order to convince people of the urgency of taking action in the struggle against invasive species, local actors organized a number of exhibitions and seminars, as well as edited booklets and brochures. One of the interviewees, T2, also ran a programme within which local people were invited to inform the authorities if they saw any invasive species, through a form they could fill out on the Internet.

Some of the experts we spoke to had some idea about which plants were perceived as the most dangerous by local people and what kind of language would therefore touch them most and get them enrolled in the fight against them:

When forms are downloaded [from the website], it’s generally about giant hogweed or Japanese knotweed, or solidago, very often giant hogweed, because there are health risks. So people want to do something about it. (T2, biologist, 27 April 2010).

I think ragweed had a way of convincing people very easily, for then you are talking about health, insidious health problems, against which nothing can be done, you know, these allergy problems, where there are pollens that suddenly increase in our atmosphere and we can’t do anything about it. So this, this makes people react quite strongly. (T5, biologist, 25 May 2010)

The experts explained how the decision was reached to voluntarily focus on communicating about plants that caused health problems in order to get more attention. By drawing upon such emotions as the fear of illness and death, they strategically deployed discourses that, they assumed, would generate social anxiety in a manner that they deemed useful to get their own message across. This is similar to what Robbins and Moore (2013, p. 9) have found in much expert writing on invasive species: the prevailing feeling that ‘[s]cience has not done too much proselytizing, it has done too little’ and that it should be explicitly normative.

To say that a plant is dangerous, poisonous, I think one of my colleagues wrote something like that in *Le Temps* [a national Swiss newspaper]

four or five years ago, ‘a dangerous plant in the garden’, that made people react. I think we need to take this as an effective starting point and then get the message through about other plants. (T5, biologist, 25 May 2010)

Emotions can play a role, and we can use them, as long as we tell the truth, I mean, we only show facts. We say, here are the risks, so do you want to take this risk or not? (T1, biologist, 23 April 2010)

The idea was thus not only to inform local inhabitants about the issue of plant invasion but, after identifying which plants were seen as the most dangerous and why by lay people, to call upon emotions that would make them react, avoiding issue fatigue. This is not to say that what constituted an acceptable level of anxiety was always understood in the same manner, as this varied between respondents. Nevertheless, all mentioned invoking flagship species to communicate subsequently about the wider category of invasive species.

Avoiding certain discourses

Some of our interview partners mentioned however that some social anxieties could be counterproductive. Indeed, as shown by Jackson and Everts (2010, p. 2794), anxiety can take different forms, one of which is panic. In our case study, the experts appeared to knowingly walk on a thin line and tried not to get people to panic about their own health but instead to make them understand invasive species as a collective (environmental) health issue and thus react and get involved in the ‘fight’ against them:

We once or twice received phone calls from people saying ‘Oh, I don’t feel well today, is there a ragweed issue in my region?’ so we would say ‘Well, the probability is low, [laughs] it must be something else’. So we have to avoid frightening people, I don’t think that’s the goal. (T5, biologist, 25 May 2010)

However, the appeal to emotion through fear of illness was not the most controversial way of making people aware of the problem. Most of the experts saw this process as a good way to get attention. What appeared to be more problematic was the reference to an alien or foreign threat:

Some discourses are sometimes obnoxious, on foreign organisms, non-natives, but I never felt it was an approach that was more than anecdotal. Maybe I am wrong. But I think it is really the health argument that played the greater role. (T3, biologist, 4 May 2010)

Indeed, all experts interviewed were aware of the debates surrounding the use of militaristic metaphors and the immigration rhetoric. Some were even upset that some people could see or portray them as racist, or had encountered situations where their personal position was challenged:

Once I even got aggressed, very violently I must say, by a black woman [embarrassed laugh followed by pause] because my discourse on introduced species that must be fought against, and plants that should be put on black lists ... indeed very quickly one can interpret this as a UDC [Swiss far-right party] discourse, or a racist discourse. So I’ve always been at pains to separate the two, but you know, it’s easy to be confused. (T4, biologist, 5 May 2010)

Furthermore, despite the reluctance of most of the experts interviewed to use racially connoted metaphors and wordplays, they suggested that other people such as journalists did make use of such vocabulary, often after having interviewed them as experts on the issue. Such vocabulary specifically drew upon the personification of plants as strangers or aliens, often coining specific ambiguous wordplay around such ideas, as in the examples of newspaper titles we mentioned at the outset of this article:

T2: There were a lot of bad articles, at the beginning especially. There have been some articles, I don’t know, one article said ‘*Fremde raus*’ [foreigners out], and then when you read the article you would see it was concerned with invasive plants, so ...

JF: Wow!

T2: We didn’t like to read such things, but here they were! ... And I also got attacked on this. I’ve been called a racist for that. (T2, biologist, 27 April 2010)

Yet, although they were well aware of the risks inherent in the use of certain words and expressions, some of the interviewed experts still used some of

these expressions because they found them more convincing in certain specific cases. They justified such a choice by saying that they knew that the discourse on fear of strangers might be better received than discourses on health hazards:

What is great in Corsica is that you can say ‘you have some plants that are native of Corsica, that only Corsica hosts ... it is your responsibility’, and it obviously works well. ‘They are our plants, us Corsican people.’ Then we say, be cautious, some of the plants you introduced, they can cause problems to quote unquote your plants and that’s where I’m afraid of confusion, between humans and plants. Because we are like ‘your plants, your native plants, that you have to defend against the evil introduced plants’ and it’s a bit difficult. So each time I insist on differentiating between introduced plants that pose no problem and, among those plants, certain plants that have been introduced from other continents, that came without their parasites, etcetera, and that create problems. (T4, biologist, 5 May 2010)

It is interesting to note that this person tried to show how he distanced himself from his own choice of terms to a certain extent (‘I’m afraid of confusion’, ‘each time I insist on differentiating’), but nevertheless did use them when he thought they were required to convince people to take action. The use of militaristic or racially connoted terms thus does not always reflect the writer’s general spirit but their own expectations regarding the reception of their discourse by their audience.

As we have shown in this first part, local experts and policy-makers were willing to speak about invasive species to the wider public to encourage action within their gardening practices and consumer habits – in other words to produce social change. In their acts of communication, most experts and policy-makers mentioned trying to avoid making explicit parallels between mobile humans and plants, and the militaristic metaphors that are often used in other contexts, because they were well aware of the debates surrounding such terms. They preferred instead to describe how they tried to use concerns regarding illness, seeking to conjure up strong emotional and intimate responses. They tried to speak to the very specific emotions that they assumed were more locally appropriate. In other words, they tried to strategically deploy social anxieties regarding

health in order to change behaviours and practices. As for terms connoting fears of (foreign) invasion, our interview partners suggested that these appeared more prevalent within press articles and not in their own communicative acts.

The reception of communication: critical reading, uncertainty and anxiety

Forming groups and selecting the focus

Knowing how the problem was framed by experts, and how communicative acts were intended, we decided to organize focus groups to confront this to personal experience. In these, we showed groups of local people various types of documents on invasive plants. Focus groups are used in social sciences to access collective negotiations of meaning in a sort of artificial microcosm (Hopkins 2007). As their name induces, focus groups work best when people focus on a document or an object that becomes the centre of discussion and debate (Morgan 1997; Krueger and Casey 2008).

Together with a third researcher, Laurent Matthey, the two authors of this article conducted four focus groups, with diverse combinations of people in terms of age, gender, nationality, and class. In order to recruit participants, we sent e-mails to local associations and put up flyers in university halls and supermarkets, saying that we were looking for people to have a group discussion about ‘an environmental issue’. We did not give more details regarding the topic, as we did not wish to have people who were already specifically interested in the issue of plant invasions. We had between four and ten participants in each focus group, each meeting lasting from an hour and a half to two hours. The participants ranged in age from early twenties to late sixties, and were from a diverse range of socio-economic backgrounds, a happy, if largely unplanned, consequence of a rather *ad hoc* recruitment process. In contrast to Qvenild *et al.* (2014) who researched how amateur gardeners engage with invasive plants, we did not focus on gardeners and rather chose to explore more broadly how a non-expert population would react to the issue of invasive plants and the way it is framed. We did not attempt to create representative samples according to specific social criteria; this was very much an explorative study, assessing – as much as anything – the pertinence of the research *dispositif* itself. The focus groups were held outside of university buildings, in a small meeting room within a local non-governmental architecture foundation,

specifically because we were trying to create a non-threatening, informal feel to the meetings, serving drinks and biscuits.

Following a brief presentation of our research, and time for all participants to get briefly acquainted, we asked participants within the four groups to read and discuss three articles on invasive plants collectively. We wanted to present the participants with different styles and levels of language, in order to study how they reacted to words, images and staging. At this stage, our research was loosely guided by three main questions. Are people more affected by arguments on health, biodiversity, invasion, or none of the above? What type of discourse seems to create the most anxiety? Is anxiety, as suggested in prior research (Jackson and Everts 2010), a driver of action and change?

In order to choose the articles we would present, we had read through dozens of newspapers and magazines, focusing on local ones but also national (French and Swiss) ones. This enabled us to have a general overview of the way invasive species were dealt with in the media and then to select documents that could be representative of the different trends, tones and themes. We finally selected one article on giant hogweed from a local newspaper (Corbex 2010), one article from a professional journal addressing professional gardeners on the general topic of plant invasions (Lefeuvre 2004), and one technical flyer produced by the State of Geneva giving advice to citizens if they found ragweed (République et Canton de Genève 2005). All three were in French. None of these documents were scientific papers and all were addressed to either the population as a whole or to non-specialist professionals. They were concerned with a range of different plant species, all of them designated and listed as invasive according to existing national Black Lists.

Each of these documents presented the issue of plant invasion from a different perspective, with a different choice of words. The first document was concerned with the eradication of giant hogweed in a small village of the Alps. It used dramatic staging with a big photograph of people dressed in white hazard suits – as exposure to giant hogweed provokes skin burn when the skin is subsequently exposed to sunlight. It was mostly concerned with the health issues posed by this non-native plant. It mentioned an association that was being created to address this new phenomenon, suggesting that people should and are getting involved. The second document we selected was intended to inform

professional gardeners about the phenomenon of plant invasion. In order to do so, it used a lot of anthropomorphic sentences, using puns and wordplay on dangerous and threatening female strangers. The main point of this document was not health but invasion per se and its multidimensional consequences on the environment and agriculture. The vocabulary thus appealed more to the fear of strangers than the first document. It also concluded by inciting the readers to take action. The last document, a technical note edited by the State of Geneva and directed at the local population, was chosen for its apparent tone of objectivity and neutrality. Its extensive use of photographs, schemas, diagrams, and figures indeed conveyed an overall feeling of fact-based objectivity. Contrarily to the second document, this one did not use any dramatizing wordplay.

Participants in the focus groups were shown each text one at a time, followed by a loosely led group discussion for 20–30 minutes, starting with the newspaper article, then the specialized press article and finishing with the technical flyer. We considered that this would reproduce the order in which people might come across such documents in reality: there was a good chance that they may have first encountered the topic in a broadsheet, then got further information on the Internet and finally sought out specialized information from public institutions. There was also a concluding discussion at the end.

A critical reading

What quickly surprised us from the outset was the critical or oppositional (Hall 1974) reading displayed by most people, very early on in the discussions. Most of the participants had never heard of the topic of plant invasions before. Yet, unprompted, they very quickly identified and criticized what they saw as exaggerations and dramatic staging, particularly in the first two documents. Most of them, whatever their age or social background, displayed an ability to read texts critically, recognizing that there was a staging aimed at spreading anxiety, especially within the first and second documents.

JS: This article spreads anxiety. It is full of very negative words, we really have the feeling that we are being manipulated. (FG1; about Doc. 1)

JS: It looks like a crime-scene. It's staged just like ... on the picture it looks like there has been a murder and they are picking up the parts of the body ... (FG1; about Doc. 1)

LM: Everything is organized around levels of threat, it is the main strand of the article. (FG2; about Doc. 2)

GR: It conveys the idea that a catastrophe is coming. (FG4; about Doc. 1)

Through the use of expressions such as: ‘it is staged’, ‘it is organized around’, or ‘it conveys the idea that’, focus group participants demonstrated their ability to analyse the structure of the texts and to decode them (Hall 1974). They were clear about the fact that all documents had a specific purpose and a specific audience, and that they were constructed in order to achieve a particular objective. In particular, they felt that the construction of Documents 1 and 2, both in terms of text and layout, was aimed at propagating anxiety. What was not clear to us, however, was whether this was a carefully honed ability to analyse and step back from such documents, or instead was more a sort of diffuse suspicion and mistrust of all authority discourses: a sort of generalized suspicion of anyone speaking from a position of power, including politicians, scientists, and the media.

In most of the groups, the participants reacted very differently to what can be referred to as health arguments and what they often called xenophobic arguments. They thus showed an ability to decode the structure of the documents and their discursive registers, and massively rejected the discourse on foreign invasion:

EJ: In the blacklist, are there only exotics or also invasive yet native plants?

JF: Only exotics.

MJ: Xenophobic again, xenophobic!

EJ: It bothers me.

MJ: A xenophobic notion.

EJ: Yes, it’s, it’s, it’s

JF: Sorry?

EJ: I’m fed up with all this protectionism.

GR: The reason why it is only exotic plants, it’s because they are not native so they may ... disrupt the natural ... balance of the place.

EJ: Yes, but we also have some native plants that are invasive. They can be invasive in other countries, but some are also invasive here. (FG4)

Some participants even mentioned that the term blacklist reminded them of the tragic events in Europe in the mid-twentieth century.

However, a minority of participants had a more hegemonic, or perhaps superficial, reading of the documents (Hall 1974), or in some cases a paradoxical attitude towards the message of the text. JS for instance, although he was aware of the staging of the issue and criticized it strongly (see above), nevertheless felt personally touched by the danger:

JS: It is scary! And it makes you think ... I didn’t know there were such dangerous plants in nature. (FG1)

RN: Maybe I am catastrophist by nature, I know, but I think we shouldn’t mess with it, or laugh about it. (FG2)

This interpretation somehow convinced them that there actually was an emergency, or at least an unprecedented problem. On the contrary, some people had an oppositional reading of the documents, as they denied the fact that the authors of the articles were trying to scare them. More specifically, they attempted to show that they did not find the articles successful in scaring them:

JF: So are they trying to scare us?

SM: No.

AG: Oh no! Not really!

DV: Less than the atomic bomb!

AG: Less than nuclear waste!

SM: But, well, it is one of the few things that make us think we are protected. So it’s not scary. (FG3; about Doc. 1)

By comparing plant invasion to the atomic bomb or nuclear waste (the comparison may have been inspired by the hazard suits worn on the photograph), they recontextualized the danger and distanced themselves from the message. Furthermore, the hazard suits on the photograph also reassured some participants who considered that as long as the problem was known and was addressed by the authorities, then everybody was safe.

Some participants were less scared by the message conveyed by the documents than by the authors who wrote them and what they assumed to be their ideology:

AG: It is a bit scary, I think, such an article, because I find it insidious, it gives arguments to people who may wish to have the upper hand on the fertility of things, to govern more, to earn more money, to impoverish etcetera ... And to master everything. And this makes me afraid. (FG3; about Doc. 2)

Even though a minority of participants was actually affected by the health-hazard language and expressed a form of anxiety, most of them attempted to deconstruct the arguments and had a clear understanding of when the words were supposed to have a frightening effect. They expressed that they preferred, in general, to be addressed with neutral terms, in order not to feel manipulated. In that sense the third document, that appeared more objective, was the most appreciated.

DT: I think that, to be convincing, the article should adopt a neutral position. One should really be neutral, in terms of expressions or words, to speak about any determinate topic. (FG4)

Of course, it is hard to say what is neutral or not. For instance what appeared in the third document to be neutral information to some people (the extensive use of maps and diagrams) was deconstructed by (often more educated) others, who saw them either as constructs whose only use was to convey fear in disguise, or as a way to dissimulate the truth under uncriticizable figures and maps:

JS: And some information is hidden, because what's dangerous is the pollen, if I got it right. And here they give us the blossoming period, so if you combine both information, you figure out that 8 months out of 12 the plant is not dangerous, the only period when it's dangerous is during the summer. (FG1)

What should be kept in mind is the ability of most of the focus group participants to decode the multiple discourses on invasive plants, as well as their staunch rejection of what they called xenophobic discourses. On the other side, a minority of them felt personally touched by the health arguments, especially when it came to children.

On uncertainty and anxiety

As in many other arenas of environmental issues – climate change springs to mind most forcefully, but more broadly many fields linked to the idea of the Anthropocene and human impact on global ecosystems more broadly – the question of uncertainty appeared central in creating anxiety. A certain number of publications in communication studies have treated the issue of anxiety and uncertainty during the last thirty years (see e.g. Friedman *et al.* 1999), often with the assumption that uncertainty produces anxiety and should thus be reduced in order to improve the quality of the communication (Brashers 2001). However, as Brashers (2001) mentions, this assumption often does not leave room for the manifold expressions and modes of reception of uncertainty.

Our final section is organized around three distinct arenas of uncertainty regarding the definition and management of invasive species that our focus group participants helped us to identify: uncertainty about scientific data and the state of knowledge itself; uncertainty about the correct course of action; and uncertainty related to the definitions and categories present. We then finally analyse the way uncertainty is received and (a) participates in the distrust of experts, (b) nourishes forms of anxiety.

All three documents were interpreted as paradoxical in their own way by the participants, as they were seen to convey a sense of uncertainty around the knowledge and data itself. For instance, in Document 3, which was interpreted as the most neutral and thus the least likely to bring about anxiety in the first place, a sense of uncertainty was perceived:

MM: At one point they say it is poorly competitive, then they say it may compete with the other species of this biotope. So in fact they don't know! (FG2; about Doc. 3)

JS: Here it says it doesn't seem to pose problems for indigenous species yet, but it won't last long, right, we know them [ironic], and at the same time, it does compete with species in its biotope. So does it compete or not? Does it pose problems or not? Because the two paragraphs are contradictory. (FG1; about Doc. 3)

AK: They say 'may provoke' so there is uncertainty. So there is not really ... we are not sure that there are dangers linked to this plant. (FG3; about Doc. 3)

Two different sorts of uncertainty were experienced and related by the participants here: the first is uncertainty due to probabilities of plant invasion ('they may provoke') and the second is a kind of uncertainty expressed through contradictions ('the two paragraphs are contradictory'). In Brashers' (2001) terms, people experienced probabilistic uncertainty and insecurity about the state of knowledge. As a consequence, the participants perceived a sense of uncertainty about what action to pursue:

RD: They seem to be pretty hesitant, regarding the method they should employ, the association is only starting to act, so they don't seem to really know what they are doing! (FG1; about Doc. 1)

YM: Well, on this aspect of fear, it is true that it scares me more in the sense that there is no solution. (FG3)

Experts who are not experts anymore in a context of uncertainty appear hesitant and inefficient, which tends to affect people's perceptions of them. This disruption of the usual social role attributed to experts creates a sense of anxiety as people do not know who to rely on anymore and get a feeling that there is no way out, as illustrated by the comment 'it scares me more in the sense that there is no solution'.

Lastly, the focus group participants noted a certain level of uncertainty regarding definitions and categories:

MM: It is not quite clear, between the imported and the local, it is not clear, at which moment do we say that a plant is indigenous, and at which moment it is ... it is alien. (FG1)

Indeed, the problems caused by the plants were multiple but many of them, the participants noted, could also be found in so-called native plants. In the second document, this was even rendered more complex as the writer went as far as Prehistoric times to say that there have always been exchanges of plants between groups of humans. The participants thus discussed what temporal scale was appropriate to define what plant is 'native' or not. This critical engagement with the notion of nativeness mirrors the findings of Qvenild *et al.* (2014, p. 31), who note that 'the gardeners did not to any degree practice the alien-native dichotomy constructed by scientists and environmental policymakers'.

These various types and dimensions of uncer-

tainty were in themselves anxiety producing, even if – for scientists – such lack of certainty is part and parcel of how they engage with the world.

UG: People who didn't know about this phenomenon now know about it, and they panic because now they are full of questions ... It is not preventive at all. What's more it actually accelerates the panic. (FG4) (About doc. 2)

ME: Do you consider yourself well informed, having read this text?

VB: I feel rather distraught ... because there is no conclusion, maybe, it makes you puzzled. (FG3; about Doc. 2)

The feeling that nobody really knew what was happening, how to react, or how to precisely define the phenomenon, thus made people doubt the ability of experts and policy-makers to take efficient action, and made some people simply feel panic or disorientation. Others, instead, felt compelled to learn more:

YM: Does it make me curious? Yeah, definitely. We want to make our own inquiry in order to construct our own opinion. (FG3; about Doc. 2)

We can wonder at this stage whether the expression of uncertainty itself leads to the production of such social anxieties or if it is rather its combination with dramatic stagings and hard-hitting words that does. Indeed, Documents 1 and 2 presented the participants with both dramatic expressions and metaphors, and uncertainties and questions. The combination of the two may accentuate the feeling of anxiety. However, Document 3 also conveyed negative perceptions of uncertainty in spite of its apparent neutral and fact-based appearance.

Conclusion

The first objective of our article was to explore how local experts in Geneva have framed the issue of plant invasion and how they consciously deal with the issue of emotion and affect around a topic that has been the object of some public debate. In our case study, we have shown how experts relied and called upon lay citizens to take action against invasive plants, in a struggle presented as unwinnable if private spaces are left aside. In order to produce the expected social change in gardening practices, the experts we spoke to strategically deployed a

discourse aimed at producing social anxieties. As Dutartre and Menozzi (2008) have also noted, the problem of plant invasions is shaped in the public sphere by anxiety-provoking discourses operating on two different levels: the fear of illness and threats to human health and the fear of the strangers. However, our expert interviewees were clearly and keenly aware of the critiques made to the use of belligerent and militaristic terms regarding invasive species. In response, and rather than shy away from all appeals to affect, they chose to concentrate their communication on the health hazard that can be caused by some of these plants, turned into flagship species. Yet, in contrast to this cautious use, our prior sampling of articles in many newspapers and online media does anecdotally appear to show that the use of anthropomorphic and militaristic terms is relatively widespread. It is this latter type of vocabulary that has received the most attention from scholars, even though, in our research at least, it is no longer the preferred entry point of experts and policy-makers in their public communication.

According to Jackson and Everts (2010, p. 2793), once anxieties become institutionalized, they can evolve independently from individualized fears. They illustrate this idea through the example of the withdrawal of goods from supermarket shelves in the context of food scares: consumers are then implicated in the social condition of anxiety regardless of whether they are personally anxious. In our research, however, the institutionalization of social anxieties was closely dependent on the awareness of each and every citizen of the topic at stake and their anxiety towards it.

The second point of our article was to show that ordinary people display a critical reading of the communication on invasive species, notwithstanding the somewhat forced context in which this took place. Just as social scientists do, lay people deconstruct the discourses that are presented to them. In particular, our focus group participants strongly rejected the highly charged invasion vocabulary that was presented to them in the first two documents. The lexicon on health hazards appeared to be more effectively appropriated by people, because it played on individual emotions and vulnerability, creating anxiety on a personal rather than on a social plane. This somehow corroborated the experts' choices that we discussed at the outset. Nevertheless, this explicit attempt to enrol citizens through affect led to the diffuse feeling amongst our focus group participants that all invasive plants were somehow dangerous to human health, further confusing the issue.

Third, beyond the noticeable reception of the health argument, another more surprising dimension came out of the focus groups: the reception of scientific uncertainty. Indeed, whereas focus group participants were suspicious of the militaristic metaphors and journalistic stagings, which, they thought, were exaggerated, they nevertheless reacted to the multiple expressions of uncertainty. We argue that these concern three main domains of uncertainty: uncertainty about scientific knowledge, uncertainty regarding ways of action, and uncertainty about the categories we use. These expressions of uncertainty can have three main effects. First, and especially when combined in the same document with hard-hitting words and metaphors, they may participate in the diffusion of social anxieties, and frighten those who do not understand how or why such a dramatically-presented phenomenon is not completely understood and not easily fought against. It draws on the fear of a nature that cannot be mastered and thus may directly threaten us. Second, people may ignore the situation since nothing seems to be certain and leave it to experts. Lastly, uncertainty can lead people to question the experts' knowledge, since they do not seem to be so 'expert' anymore. This last result contrasts with Mauz and Granjou's (2008) argument that uncertainty may not produce as much defiance towards public experts as is often thought. In their case, livestock farmers facing the probable arrival of the wolf took uncertainty as a display of honesty on behalf of the authorities because they knew, through their own expert experience, how difficult it was to quantify probability. In our case, the public was made up of people who did not specifically relate to the topic prior to the research and thus did not feel they were in a position to compare the experts' evaluation of uncertainty with their own knowledge. Whereas professionals do recognize the value of uncertainty, this does not appear to be shared by lay audiences. Our article thus adds insight to the research on public response to uncertainty by showing that the reception of uncertainty by various audiences is as diverse as the types of uncertainties expressed.

Furthermore, when expert categories appear uncertain, their legitimacy appears to be questioned by lay people. Indeed, some participants mentioned other dangerous but native plants – mushrooms and nettles were mentioned several times by different people – and wondered why we should treat invasive plants differently; a question also asked by some scientists (Davis *et al.* 2001, 2011; Robbins

and Moore 2013). This was an important point as it questioned the coherence of the category of invasive plants in itself and whether there are 'good' and 'bad' proliferating species (see Claeys 2010). The issue at stake thus seemed to be more about dangers to human health posed by specific plants than about the specific danger of non-native plants as a whole.

Lastly, it may be useful to reflect critically on the methodology we adopted here. The set-up of the focus group, especially the collective focus on an article, may create an atmosphere where people are encouraged to have something to say about a document and therefore tend to criticize it more than they would outside of the group. However, it seems to us that despite this somewhat staged research setting, these results are interesting in showing that ordinary people do perform a critical reading of communication dealing with invasive plants. There is also a difficult-to-measure group effect: when a specific reading of a sentence was suggested by one individual, this was variously picked up or ignored by others. As each group picked up themes differently, we found it very difficult methodologically to measure this group dynamic. The theme of xenophobic or racist vocabulary, for instance, was variously appropriated by each group, and while it was always introduced by someone, each group did not always develop it in the same way. If this focus group methodology is to be used more widely to explore species invasions, this group effect would need further analysing. We got the feeling that the internal hierarchies and balances of power that emerged collectively amongst individuals played a part in which topics got picked up, with some individuals having more success in introducing topics, but we did not have sufficient data to fully analyse or understand this. This would be an interesting path for future research on the reception of discourses on invasive species.

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Notes

1. 'France is starting to track down its invaders'.
2. 'Geneva is resisting ragweed, the plague invading Europe'.
3. 'The diversity of life threatened by globalization'.
4. 'Over 10,000 exotic plants endanger European biodiversity'.
5. 'Toxic plants dug up in Haute Savoie'.
6. Even though ragweed makes a yearly reappearance in the media each summer.
7. As the experts interviewed are, to varying extents, public figures, they are anonymized. Focus group participants, in the next section, are presented with their initials, as their only defining feature for participating was their interest in environmental issues, which does not give any clue to who they are.

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