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Strategies for dismissing dietary risks: Insights from user-generated comments online

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Short title: Strategies for dismissing dietary risks

Abstract

Communication around chronic dietary risks has proved challenging as dietary health risks are ostensibly met with attenuated perceptions of their likelihood and consequences. In this article we examine the strategies that an online public use to negotiate risk messages from expert stakeholders that may be incongruent with their own position on a risk. Progressing from conceptualisations of amplification as laid out in the social amplification of risk framework, we are particularly interested in understanding whether and how amplifications of risk may be attributed toward other stakeholders. The article presents an analysis of comments posted on a website oriented to a British audience. These comments were left by members of the public in reply to two online media articles published in 2012 reporting on an

epidemiological study carried out in the United States on the risks of red meat consumption. We found that the comments generally expressed resistance to the risk message, embodied in two main strategies. The first strategy was to discount the message itself by deploying rules of thumb that undermined the applicability of the general risk message to the particularities of the individual. The second strategy was to undermine the risks by casting doubt on the credibility of the message source. Together, these strategies allowed the commenters to argue that the risks and the process of communicating them resulted in an exaggerated picture. These findings highlight that by attributing amplification to others, further polarisation of risk views between stakeholders may occur. Thinking about amplification as an attribution provides a distinct and significant conceptual contribution to the study of incongruent risk responses.

Keywords: risk, risk amplification; dietary health; risk perception; online comments

Introduction

Potential mismatch between lay and expert risk perception is often one of the most challenging aspects of risk communication (Hansen et al. 2003). At the heart of this mismatch lies the fact that expert risk assessments often jar with public understanding of the risks in question, leading the experts to view public responses to risk as not in line with the recommended preventative actions. For example, scientifically-proven links between inadequate diet and negative health effects (such as obesity, heart disease, cancer) are often met with significantly less concern than experts would expect and less action than they would like (Perez-Cueto and Verbeke 2012). The difficulty of communication efforts are taken to indicate that the public is reacting to dietary risk messages with indifference, cynicism, and resistance (Perez-Cueto and Verbeke 2012; Patterson et al. 2001; Goldberg and Sliwa 2011).

One reason for this may be that lay consumers draw on sources other than scientific when making sense of dietary risks, such as wider socio-cultural values, personal practices, and other consumers' opinions or interpretations of the risk in questions. In this article we draw on a study that investigated how resistance to dietary risks was expressed by examining an online public negotiating risk messages about the health risks associated with over-consumption of red meat. In this article we examine what strategies lay consumers employed when making sense of dietary risk messages by paying particular attention to the attributions that were made about other actors' or stakeholders' positions. Such research might enable us to anticipate how individuals sustain views about risks that may be divergent to other more authoritative, powerful or numerous stakeholders (Busby and Duckett 2012).

Negotiating risk messages

Lay reasoning around risk

In recent decades, understanding lay risk perceptions has become an integral focus of risk communication, increasingly moving away from the 'deficit' model of risk communication which has often failed to take into account the wider processes that influence public perceptions of risk. The deficit model assumes that the public do not have sufficient information to accurately interpret an objective risk, and thus lack the ability to assess its probability and outcomes (Joffe 2002; Hansen et al. 2003). This model, and its proposed solution that the provision of clear and accessible information will result in the formation of 'correct' risk perceptions, has been widely criticised as offering no more than a 'knowledge fix' (Eden, Bear, and Walker 2008). It is now widely acknowledged that lay thinking about risk is deeply embedded in social, cultural, and political values and underpinned by issues of trust, equity and economics (Sturgis and Allum 2004; Knight and Barnett 2010). Compared

to technical experts, the public typically will include a wider range of considerations and local resources when reasoning about a risk, framing it in a way that makes it relevant to everyday beliefs and practices (Horlick-Jones and Prades 2009; Horlick-Jones, Walls, and Kitzinger 2007; Marcu, Uzzell, and Barnett 2011).

The public commonly make use of personal experiences and values to interpret and accord significance to risk through the use of ‘lay logics’: rhetorical devices which represent sense-making talk about risks that are often less scientific and more informal than the expert ones (Petts, Horlick-Jones, and Murdock 2001). When interpreting risks, individuals draw upon ways of thinking that are socially accepted by the groups with which they identify – widely accepted images, symbols, and metaphors are favoured in reasoning about the risk. Often, the lay logics of risk that people draw upon are platitudes which enable individuals to resist risk messages, for example ‘if it’s going to happen, it’s going to happen and you can’t do anything about it’ and ‘if you listen to everything you weren't supposed to eat or touch you wouldn't eat anything’ (Petts, Horlick-Jones, and Murdock 2001). In this article, we investigated the nature of lay reasoning that an online public make recourse to in order to negotiate dietary risk messages.

Attributing amplification and attenuation to others

As we have already noted, it is widely accepted that individuals do not passively receive information when authorities give ‘top down’ messages (Barnett et al. 2011); as a result, their perception of a risk may differ significantly to that of an expert, often leading the expert to judge the public response as amplified or attenuated. The idea of discrepancies between lay and expert responses, and the implications of this, lies at the heart of the social amplification of risk framework (SARF) (Kasperson et al. 1988; Kasperson 1992). The main tenet of this

framework is that risk signals ‘interact with psychological, social, institutional and cultural processes in ways that can heighten or attenuate individual and social perceptions of risk and shape risk behaviour’ (Renn et al. 1992, p. 139), which can subsequently lead to ‘ripple effects’ in other domains (such as economic, social, regulatory). Thus, social processes combine to produce intensification or attenuation of a risk event. Busby and colleagues (Busby, Alcock, and MacGillivray 2009; Busby and Duckett 2012) have proposed an alternative framework to account for such phenomena. They view intensification or attenuation as *attributions* that are made to others rather than as individual perspectives: others’ responses are represented as irrational or disproportionate, and this helps to protect one’s own beliefs and practices (see Busby & Onggo, 2012). So rather than being the outcome of the interaction between risk signals and socio-cultural processes, intensification and attenuation reflect how individuals explain each other’s responses (Busby and Duckett 2012). For example, in the context of emissions reduction, (Busby et al. 2009), stakeholders (particularly those in industry) claimed other stakeholders’ responses as disproportionately amplified compared to the available evidence. There is also evidence that these attributions enable stakeholders to resist risk beliefs that are incongruent with their own. Busby and Onggo (2012) found a range of stakeholders privileged their own views about zoonotic disease outbreaks and defended them in part by reasoning about other stakeholders’ views being exaggerated or under-played.

In this article we build on the thesis that amplification and attenuation are attributions made to others and set our second objective to investigate how the public attribute intensification or attenuation to other actors and whether this attribution is used as a means to resist risk communications. We locate our exploration of lay logics of risk in the context of online public reactions to media reports of the dietary risks of red meat. Such an approach allows us to explore how the public take into the account the views of other consumers when

making sense of the communicated risks, and to observe risk amplification and attenuation as attributions made to others. This approach allows us to move beyond understanding how the public use a variety of sense-making tools (for example lay logics) when resisting an incongruent risk to understanding how the public makes sense of and deals with other stakeholders' divergent responses to risk. In line with Busby and Duckett (2012), we do not argue that all subjective attributions of amplification or attenuation are equally valid. However, we do propose that these subjective attributions play a likely role in determining intentions and actions and that for this reason they merit further investigation.

Methods

Online methodology: the news media's comments section

The comments sections of online media articles can provide the context for exploring lay perceptions of dietary risks as risk reporting on red meat has elicited heated debates and considerable public reaction online (Carslaw 2008; Spiegelhalter 2012). Although research on online comments is in its infancy (Jaspal, Nerlich, and Koteyko 2012), it offers opportunities for investigating how individuals make sense of risk messages (Rowe, Hawkes, and Houghton 2008; Holmes et al. 2009). However, the content of online comments cannot be said to be representative of the general public, given that the profile of those commenting is unknown (Laslo, Baram-Tsabari, and Lewenstein 2012) and that the opinions expressed belong to individuals who have access to the internet, and choose to read and comment on online news articles. Previous research has suggested that those who tend to comment on media articles are 'blindly opinionated', that is they use the comments section to voice their own point without engaging in a dialogue with other participants (Richardson and Stanyer 2011). A number of studies have found that the majority of individuals who engage in

commenting on an article are more likely to make negative comments on or disagree with the subject matter of the article (Freeman 2011; Glenn, Champion, and Spence 2012; Bezreh et al. 2012; Chmiel et al. 2010; Secko et al. 2011). It has also been suggested that those individuals who perceive articles' messages as incongruent to their beliefs are more motivated to voice their opinion and opposition (Freeman 2011; Holmes et al. 2009). Whilst it is clear that readers' comments cannot be interpreted as generalisable, they may nonetheless provide insight into the deliberative processes of those who choose to react publicly to dietary risk messages. Furthermore, the views offered on these sites may reflect the way that *some* people react to the topic in questions, and consequently are qualitatively interesting (Rowe, Hawkes, and Houghton 2008). Online comments are also valuable as research data because they reflect spontaneous, unsolicited opinions not affected by study demand characteristics or researcher bias. This data is ecologically valid, that is to say, it allows us an insight into the 'real responses of real readers responding to real articles that they really cared about' (Laslo, Baram-Tsabari, and Lewenstein 2012, p. 865).

Ethical considerations

As for what ethical steps are needed when using online data, it has been suggested that online research should be exempt from usual ethical regulations if the research involves pre-existing public data or if the information is recorded in such a manner that subjects cannot be identified (Kraut et al, 2004). For the current study, the website hosting the data was not subject to password-protection (Krotoski 2012); furthermore, guidelines on the news site in question provide reminders to commenters on the public nature of their posts. To protect the identity of the commenters, we drew on guidelines from the British Psychological Society (2013) and on previous studies which have utilised pre-existing online data (De Brun et al. 2014). To avoid traceability of the comments through online search engines, and in line with

advice from the BPS, we used paraphrased or composite quotes in the Findings section. Furthermore, we treated the screen names of the commenters as real names and kept all quotations anonymous. Finally, we have restricted the identifying details relating to the articles. Given these considerations, this study was granted exemption from full ethical review by the ethics committee of University College Dublin.

Data source

In this article we use data from our study of ‘online comments’ posted in reply to two related articles published on a popular, mainstream and well-regarded British news media website. Whilst we do not know anything about the demographic characteristics of the commenters in this study, information provided on the news media website states that readers of this website are primarily a British audience, and are, on average, better educated and more affluent than the general public. Each comment (that is each single text entry posted directly in response to the news articles) was a unit of analysis (Jaspal, Nerlich, and Koteyko 2012). These comments varied from a couple of words to several sentences. Comments were displayed with the username of the commenter and the date and time of the post. The second article followed on from the first, with both articles discussing a peer-reviewed scientific study about the dietary risks of red meat such as cancer and cardiovascular disease, which had been published in a highly-ranked journal in the medical field. Both articles discussed the findings from the scientific study including the increased risk of early death from over-consumption of red meat; provided advice to the public on reducing red meat intake; and provided quotes from expert sources (including scientists and dieticians). The language and tone of the articles was relatively neutral and non-sensationalist. The articles were both published in the same week in spring 2012. Comments for both articles ($N = 959$ comments) were posted over a period of one-two days, after which the comment threads were closed. As the analysis

proceeded, it was evident that themes were similar across both articles with no substantial differences found so no comparisons are made between postings for each article.

Inductive thematic analysis

We adopted an inductive, data-driven approach to analyse the data, using the 6-stage thematic analytic strategy described by Braun and Clarke (2006). In the initial stages of research, two coders read and became familiarised with the dataset, and independently coded the whole dataset before coming together with a third independent coder to discuss disparities or ambiguities. Barbour (2001) argues that concordance between coders is not the imperative issue in multiple coding; rather, the value of multiple coding lies in the greater insight that follows the discussion generated by potential disagreement between coders in the team. A coding framework was continuously developed during the coding and a method of ‘constant comparison’ was employed to structure the coding framework – emerging codes were compared with established codes to merge similar codes together. Following the coding stage, broader categories were developed with codes being merged together to begin the process of identifying themes or emergent concepts. Thematic maps aided this process. The themes were refined following further discussion amongst the wider research team, and illustrative names and definitions were given to the themes. QSR International’s NVivo 8 and NVivo 9 qualitative software were used to organise the data.

Findings

Although our qualitative analysis does not place weight on quantitative figures, given that the primary themes presented deal with strategies of risk resistance, it may be helpful to first provide the reader with some context within which to place these themes. There was an over-

arching theme of risk resistance within the comments, with 75.6 per cent ($N = 725$) of the comments indicating resistance or criticism of the risk message. The vast majority of those that commented on the articles were of the view that the risk information did not correspond with their own views about the risks of red meat. 11.5 per cent of the comments ($N = 110$) were neutral or off-topic, whilst 12.9 per cent ($N = 124$), objected to the resistance of the risk message by their fellow commenters and perceived the risks associated with red meat to warrant attention. Of particular interest was the considerable number of commenters within this last segment that seemed to wade into the thread in order to reply to comments they felt were irresponsibly and inaccurately dismissing the risk message. In the themes which follow, we concentrated on those majority comments which reflected a disagreement with the risk message. It was of particular interest for the purpose of this article to find that the vast majority of comments were situated within some form of resistance to the risk message, which was achieved through two main avenues. The first reflected an array of positions offered by the commenters to resist the risk message and discount personal susceptibility to the risk. The second theme reflected attributions of amplification of the risks of red meat by the commenters to other stakeholders within the risk process. The thematic map in Figure 1 illustrates the themes and sub-themes under this over-arching theme of resistance. To ensure anonymity we do not report the username of the commenter.

< *Insert Figure 1 Here* >

Experience-based rules of thumb: attenuation of personal risk

Comments in this category resisted the presentation of the risks in the media articles through the deployment of experience-based rules of thumb and lay logics of risk to support the

commenters' position that the risks of red meat were not applicable to oneself. These commenters were not in agreement with the study and media stance that one should be concerned about and/or reduce red meat consumption. They filtered the risk information through a range of values and experiences, and this offers us insight into the process of lay reasoning that accompanied resistance to dietary advice.

It's quality not quantity that matters in life. Many commenters invoked arguments about the futility of trying to outrun death, questioning the scientific 'obsession' with prolonging life at any cost. These commenters argued that they held broader life values to be just as, if not more, important than the physical consequences of diet, and that psychological well-being, fulfilment and quality of life were more important than length of life. The position of these commenters was that life was there to be lived, rather than spending time worrying about what to eat and depriving themselves of the things they enjoy, for example red meat. Through rhetorical devices such as truisms, the commenters broadened their frame of thinking about this risk which served to trivialise the perspective in the article:

Oh for petes sake, we are all going to die one day. Enjoy it while it lasts. I wish these 'scientists' would go on with some real work.

Longevity isn't the be all and end all. What you do with the time that's given to you is what is important. I'd rather die at 62 after a fulfilled life than at 82 after doing nothing much. I am 64.

We have always eaten red meat. A considerable number of commenters argued that red meat has always been a part of human diet therefore it could not possibly pose a health risk. There

appeared to be an attachment to eating red meat – these individuals viewed it as part of their identity and history worth protecting. Many of these commenters discussed how they, and also their families and ancestors, were brought up on red meat; that red meat was intrinsically tied with their culture; and that the risks it posed could not be true as a result:

This finding is difficult to believe when you consider human history over the thousands of years.... Mankind has been eating red meat for thousands of years and not everyone went on to develop cancer and heart risks.

Some commenters questioned whether the risks attached to red meat might not be due to the red meat per se but rather to some sort of adulteration resulting from food processing—evidence of an attempt to distance red meat from risk and to allow continuation of consumption of red meat by eating ‘organic’ or ‘good quality’ red meat in order to protect their red-meat eating practices:

We have evolved over centuries as hunter-gatherers and we have always eaten meat in all of its forms. So does this study not say a lot more about farming methods and what is done to our food than the actual food itself?

Everything in moderation. This rhetoric was invoked throughout the discussion thread by commenters urging the adoption of a common-sense approach to the purported risk. They questioned the rationale behind the risk message given that the information provided was

supposedly well-known and the risk in question, one which can be very simply dealt with, rendered it negligible. By advocating a common-sense approach, namely a strategy of eating in moderation, they argued that one can deal with any potential risks. Therefore, these commenters doubted the necessity of such dietary advice, with many characterising this report as needlessly raising attention to a negligible risk:

The history of health advice would suggest that anything outside of moderation is bad for you...Move along everyone, there's nothing to be concerned about here.

Everything can't be bad for you. Many commenters saw the media articles as a chaotic risk communication process. There was a socially-shared response that 'everything can't be bad' as these commenters located the risk of red meat within a constant stream of expert risk advisories relating to diet and lifestyle riddled with conflicting evidence. Some of the commenters expressed resentment at being told what to do and what to eat on a constant basis, viewing these advisories to be intrusive and interfering with personal choice. Adopting the attitude that not all of the advisories in this chaotic environment could be true enabled the individuals to downplay the risks and deal with the threat to their eating behaviour:

For goodness sake, what isn't unhealthy nowadays. A lovely steak sandwich coming right up.

I am so fed-up of these so-called experts telling us what to eat and what to do. If we listened to them fully everyone would be suffering from

dehydration and starvation and end up being with an even greater risk of death.....I'll take this latest piece of information with a pinch of salt.

Attributing Risk Intensification to other Stakeholders

Comments in this category were grounded in commenters reflections on the stakeholders involved in the stories and on the agendas within which the stakeholders' actions were embedded. Some commenters attributed intensification of the risk to specific stakeholders such as the media. Others, interestingly, took the media account at face value and blamed the scientific process – such as the study design - for overstating the risk. More generally, commenters held a diffuse body of authorities responsible for exaggerating dietary risks and communicating them in a way that was both unwarranted and counter-productive. This was in turn linked to the suspicion that behind this there was a broader agenda.

Irresponsible media amplifying the risk. A sizeable proportion of commenters referred to the media's tendency to exaggerate dietary risks. There was a strong moral sense about this as the commenters viewed the articles as irresponsible journalism from an organisation that occupied a powerful position as an intermediary between the public and the scientific process. A number of commenters viewed this media as distorting the risk due to a lack of critical engagement with the science and amateur scientific reporting. These commenters blamed an uncritical media for failing to comment or report on the limitations associated with the study design such as: neglecting to highlight that correlation does not equal causation; reporting relative risk without a baseline; and leaving out important details on how to interpret the risk. There was an underlying demand from these commenters that the media

should be more responsible in their reporting of scientific risk assessments so that the public can interpret a risk within its full scientific context:

Can somebody teach these journalists some basic statistical skills. At the very least the mantra of ‘Correlation does not equal causation’

Whilst some oriented their anger to the media as an entity, others focused on the portrayal of the risk within the article and criticised the scientific reporting style more than the media itself, for example for the poor use of relative risk reduction:

It's like the scaremongering around the Fukushima nuclear plant failure. 2000 times background radiation level might sound frightening, but the background level is almost zero, and 2000 times almost zero remains almost zero! A 12% increase in early death doesn't mean you go from a 6% chance to a 18% chance - it means you go from a 6% chance to a 7% chance. Horrifying, isn't it?

Some of the commenters viewed the amplification of risk as reflective of the media's inherent nature to dramatise and hype in order to create news value and attention. There was considerable annoyance directed towards media for engaging in such alarmism, viewing it to be irresponsible journalism. Many of these referred to a number of sensationalising ‘tools or techniques’ used by the media, such as deliberate failure to report the risk in an accurate manner by choosing to use statistics and expressions which amplify the ‘real’ risk. While we discussed already the inadequate use of risk expressions by the media, here it was quite

evident that these commenters viewed it to be a *deliberate* tactic to sensationalise the risk. Journalists were viewed to be intentionally omitting vital interpretative details and using misleading risk expressions (particularly relative risks) and language to scaremonger:

The way the media comment on relative risk is absurd. If you have a minor risk, you could double or triple this and it would still be a minor risk, yet the media would yell that you are 200%-300% more likely to die.

Technically maybe it's accurate but it's very deceptive. It would be more helpful to report the absolute risk but of course this would not be sensational enough for the media.

Flawed science. Representing the most dominant attribution theme, a large number of commenters questioned the ability of the science underlying this risk assessment to make such associations between consumption of red meat and health risks, and queried whether the science may be amplifying this risk unduly. These commenters cautioned about 'jumping to conclusions' on the basis of a scientific assessment which they viewed to be fraught with limitations and misinterpretations. Their criticism of the scientific process appeared to be largely based on extracts they had read within the media article about the study. Unlike the previous theme in which media was criticised for its representation of the science, the comments in this category did not question the media depiction of the science. Instead, the commenters deemed the article extracts a sufficient representation of the science and a good basis upon which to criticise the study. A large proportion of these commenters questioned the reliability of the scientific assessment according to which such health risks were associated with eating red meat, and claimed that they failed to control for potential

confounding factors. They questioned the nature of scientific evidence and viewed this type of ‘correlational’ or observational/epidemiological science to be flawed and leading to misinterpretations regarding the relationships between the health risks and eating red meat:

Studies like this one generally raise more questions than give answers. This is an uncontrolled study which used questionnaires. What it shows is the significant correlation between a diet of red meat in the amounts they defined and a larger chance of death from cancer and heart disease. What it **CANNOT** do is conclude red meat is the cause of those illness and deaths.

Agenda-driven stakeholders. Many of the commenters tended to situate their comments within the wider diet and health conversation, opting to use these articles and comment thread as a springboard to voice their opinion on the constant daily diet of risk issues being served up to them. These advisories were perceived to be indicative of a scaremongering agenda from a diffuse out-group of individuals which were consistently referred to as ‘them’ or ‘they’, thus alluding to a ‘shadowy bunch of experts’ out there disseminating public health advice under the ‘it’s bad for you’ agenda. This group was inferred to exist from the continuous and sometimes contradictory messages about food risks and benefits, which are often encountered in the public sphere. This perceived constant scaremongering was leading to desensitisation and disengagement from diet and health messages, particularly when the risk in question was cancer:

I'm getting more and more resentful of the continuous barrage of scaremongering 'advice' that is handed out to us on a constant basis under the pretence of being for 'our own good'. We are adults and if I want steak I'm having steak!

Throughout many of the other attribution instances, there was a tendency by commenters to attribute amplification to a stakeholder or process and link this to a vested interest: for example, the media were pin-pointed as having a sensationalist agenda, whilst the out-group of experts, as having an overly-cautious and health-obsessed agenda. A smaller number of other commenters also believed that this risk story was being brought to the public sphere not because of a real major health risk but because of an underlying agenda mainly revolving around research funding, vegetarian agendas, and promotion of the white meat industry. There was a tendency to query or dismiss the research findings and the risk itself as a result of these perceived vested interests:

The true basis for this story (and the study that underlies it) is money!

Cancer is a big business. Scientists don't conclusively know what causes cancer so they link everything to it allowing them to study everything under the sun to help them earn grant money their research centre

As if there wasn't sufficient vegetarian propaganda in the press, now we have some more here.

Discussion

In this article we have examined some of the strategies used by an online public when negotiating a risk message about red meat. Within the online comments section of two

articles discussing the risks of red meat, we found strong evidence to support the contention that communications on dietary health risks were met with resistance. This consisted of claims that the risk was low, criticism of the reporting style, and expressions of dismissal, indifference, and cynicism (Goldberg and Sliwa 2011). When receiving a communication on the health risks of red meat a range of strategies were deployed to depict these claims about risk as exaggerated. A range of lay logics of risk and rhetorical devices were employed to downplay the risk, and risk intensification was attributed both to stakeholders and to processes of doing science.

In our analysis we focussed on the views expressed within the online media comments section. There is support for this method of research inquiry, particularly given emergent evidence suggesting that the content of these comments sections is having an influential impact on both journalistic practices (Secko et al. 2011) and on readers' perceptions of the topic in question (Anderson et al. 2013). Before moving on to interpret the implications of our findings, it is worth reminding the setting and the constraints of the research study from which we derived the data. As we have already noted, given the unknown profile of the online commenters, we cannot say that the findings are representative of the general population. What we can identify from this type of rich qualitative data is the range of views and perspectives that are occurring in an online public discourse in reaction to a media article which communicates a dietary risk, and the discursive strategies used in such a public forum. In this article we have provided an insight into the views of an online audience that is largely resistant to a dietary risk message on red meat. As found in previous studies (Freeman 2011; Glenn, Champion, and Spence 2012; Bezreh et al. 2012; Chmiel et al. 2010; Secko et al. 2011), the comments under investigation in the current study were largely reflective of disagreement with the message being communicated in the media article, in this case, the risks of red meat. The over-representation of resistance-type comments offered us

the opportunity to develop an understanding of the types of arguments and strategies that may be used to resist dietary risk communications.

We found that the online public engaged in deliberations reflective of typical lay-reasoning to resist the health risks relating to red meat, offering insight into why risk communications on dietary health risks may not be successfully received. Despite being presented with scientific evidence on the potential harm caused by red meat, these commenters chose to process this scientific information through an interpretative lens of their own experiences and viewpoints. The deficit model of risk communication would have suggested that public rejection of a risk association that has received widespread support from the scientific community is evidence of a public lacking in sufficient risk information (Joffe 2002; Eden, Bear, and Walker 2008). However, from the public viewpoint, the cultural and everyday experiences they bring to the interpretation justify their responses. Their expressions of valuing ‘quality over quantity of life’ showed clear evidence of the interpretation of the risk assessment alongside personal values; values which they felt were not appreciated by those technical experts responsible (for example the scientists) and supportive of (for example the media for reporting it) the scientific assessment of the risk. Horlick-Jones and Prades (2009) suggested that risk reasoning by technical experts can be seen as narrowly-defined and alienating, showing potential disregard for values held strongly by the lay public. There was clear evidence of this in the current study. It may be worthwhile to consider what impact would result from framing future dietary health risk communications in relation to some of the values and experiences held close by the public.

We found evidence for the use of rhetorical devices in rationalising risk resistance. These strategies have been described as lay logics by some (Petts, Horlick-Jones, and Murdock 2001), as commonplaces by others (Myers 2007), but essentially can be thought of as ‘generally accepted arguments’ in talking about risk (Horlick-Jones, Walls, and Kitzinger

2007). For example, many of the commenters in the current study justified dismissal of the risk by arguing that ‘everything in moderation is fine’, a parallel to the Horlick-Jones et al. (2007) study where a lay logic of ‘everything good in moderation’ was employed in reasoning about technological risks. This shows that these rhetorical devices are a culturally-shared interpretative resource with universal application that can be deployed around a risk. It has been argued that these rhetorical devices have been used for both agreeing and disagreeing with a topic (Myers 2007); in the current study, we see these devices being primarily employed to resist or dismiss the health risks associated with red meat. Statements such as ‘everyone has to die sometime’ and ‘enjoy life while it lasts’ were frequently expressed and reflected the tendency of these commenters to refer to these socially-shared common-sense responses to attenuate the personal risk involved with red meat.

In this article we have provided evidence for the conceptualisation of amplification (and attenuation) as attributions made by one group of social actors towards another group. This provides an alternative but significant conceptual view of amplification to that posed in SARF, where amplification is viewed as the interaction between risk signals and a myriad of social processes. Our analysis found that a large proportion of the online public reacted to the risk information on red meat by attributing intensification of the risk to a range of other stakeholders, prioritising their own views on the risk and viewing incongruent views to be irrational risk responses. In thinking about conceptualising amplification of risk as an attribution, a key point made by Busby and Duckett is that ‘calling other people risk amplifiers is a way of articulating that they differ systematically from us, and a way of resisting their viewpoint’ (p. 1051). Like Busby and Onngo (2012), we found evidence that online commenters were holding onto their own views about red meat by reasoning that other stakeholders and processes were exaggerating the risks involved. The implication of these acts of attribution may be a much greater polarisation of risk beliefs. The commenters in our

study observed that there was a discrepancy between their risk beliefs and those portrayed within the red meat article. However, like the participants in the Busby and Onggo study, this did not lead the commenters to correct their view; rather, it led to self-confirmation of their position and further polarisation of the opposing beliefs. In considering how these findings can feed into more effective risk communication approaches, Busby and Onggo suggest that ‘risk managers’ perspectives should shift, from correcting a public’s mistakes about risk to thinking about how their own responses and communications contribute to the public’s view about a risk’ (p. 13).

As we have shown in this article, commenters identified a number of stakeholders as having amplified the risks of red meat. We found evidence of amplification directed at an out-group of authoritative experts who were viewed to be continuously scaremongering about lifestyle-associated risks. Previous research has suggested that a ‘backlash effect’ is occurring whereby perceptions of a conflicting and confusing diet and health environment will lead the public to discount diet and health messages entirely (Patterson et al. 2001). We have given evidence supporting this in this article with the commenters judging that these authoritative stakeholders were scaremongering and amplifying these risk associations, allowing them to resist and dismiss the risk. This presents a challenge to the dissemination of future public health advisories. That the media was pin-pointed as a primary amplifier is not surprising, given that other studies have found similar evidence (Lupton and Chapman 1995; Rowe, Hawkes, and Houghton 2008). Many academics have focused on the role of the media in translating science for the public (Kitzinger 1999). Some have been critical of media’s over-emphasis on the findings from an individual study with no reference to the wider literature and the omission of important study limitations (Jensen 2008; Woloshin, Schwartz, and Kramer 2009). There was evidence in the current study that a sizeable proportion of the commenters actively attributed intensification of the risk to the media and highlighted their

role in sensationalising or over-generalising the underlying scientific study, thus demonstrating that this effect is not widespread across all segments of the public and that critical interpretation of scientific media reporting does take place. However, it was of interest to find that a large proportion of the commenters engaged in criticism of the underlying science for failing to account for any confounders that could underlie the risk relationship. However, many of the commenters did not scrutinise whether or not the media report had accurately reflected all the details from the original study report; instead, it is possible that the headlines and opening sentences grabbed the attention of these commenters and led them to criticise the study based on these over-generalised details. The findings from our study reinforce that within a media article, the positioning of and emphasis placed on the uncertainty and limitations that accompany scientific research is critically important. Media framing of scientific studies is a pertinent area of study. For example Yang, Xu and Rodriguez (2014) article in this issue explores the Chinese media framing of a scientific study investigating the health effects of genetically modified (GM) golden rice. Of particular interest is the attention Yang, Xu and Rodriguez give to the inter-play between online media framing of science and the consequent reader comments these articles elicit.

Conclusion

Understanding how the public negotiates a risk communication which is incongruent with their position on that risk is important. We found that when a mismatch was perceived by the commenters in the current study, they took steps to prioritise their own positions about a risk by rationalising these positions through the use of lay reasoning or attributing amplification of the risk to others. It is important to ensure that risk managers and communicators address the concerns held by the public and consider their viewpoint and perspectives. But similarly important, in some instances there will be cases where it is in the best interest of the public to

align their views with those of more authoritative and expert stakeholders (for example where there is a real and substantial risk to human health). The current study shows that resistance to alignment in some cases may prove communication efforts difficult. Serious consideration should be given to the efforts needed to address these challenges; identifying that both stakeholders and publics alike use attributions of amplification or attenuation to resist a risk is a necessary first step.

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References

- Anderson, A A, D Brossard, D A Scheufele, M A Xenos, and P Ladwig. 2013. "The "Nasty Effect." Online Incivility and Risk Perceptions of Emerging Technologies." *Journal of Computer-Mediated Communication*. doi: 10.1111/jcc4.12009.
- Barbour, R S. 2001. "Checklists for improving rigour in qualitative research: a case of the tail wagging the dog?" *British Medical Journal* no. 322:1115 - 1117.
- Barnett, J, A McConnon, J Kennedy, M Raats, R Shepherd, W. Verbeke, J Fletcher, M Kuttschreuter, L Lima, J Wills, and P Wall. 2011. "Development of strategies for effective communication of food risks and benefits across Europe: Design and conceptual framework of the FoodrisC project " *BMC Public Health* no. 11. doi: 10.1186/1471-2458-11-308.

- Bezreh, T, M C Laws, T Taubin, D E Rifkin, and I B Wilson. 2012. "Challenges to physician–patient communication about medication use: a window into the skeptical patient’s world." *Patient Preference and Adherence* no. 6:11-18.
- Braun, V, and V Clarke. 2006. "Using thematic analysis in psychology." *Qualitative Research in Psychology* no. 3:77-101.
- Busby, J, R E Alcock, and B H MacGillivray. 2009. "Interrupting the social amplification of risk process: a case study in collective emissions reduction." *Environmental Science & Policy* no. 12:297-308.
- Busby, J, and D Duckett. 2012. "Social risk amplification as an attribution: the case of zoonotic disease outbreaks." *Journal of Risk Research* no. 15 (9):1049-1074.
- Busby, J, and S Onggo. 2012. "Managing the social amplification of risk: a simulation of interacting actors." *Journal of the Operational Research Society*.
- Carslaw, N. 2008. "Communicating risks linked to food - the media's role." *Trends in Food Sciences & Technology* no. 19:S14-S17.
- Chmiel, A, P Sobkowicz, J Sienkiewicz, G Paltoglou, K Buckley, M Thelwall, and J A Holyst. 2010. "Negative emotions boost users activity at BBC forum." *Physica A: Statistical Mechanics and its Applications* no. 11. doi: 10.1016/j.physa.2011.03.040
- De Brun, A, M McCarthy, K McKenzie, and A McGloin. 2014. "Weight stigma and narrative resistance evident in online discussions of obesity." *Appetite* no. 72:73-81.
- Eden, S, C Bear, and C Walker. 2008. "Understanding and (dis)trusting food assurance schemes: Consumer confidence and the ‘knowledge fix’." *Journal of Rural Studies* no. 24:1-14.
- Freeman, B. 2011. "Tobacco plain packaging legislation: a content analysis of commentary posted on Australian online news." *Tobacco Control* no. 20:361-366.

- Glenn, N M , C C Champion, and J C Spence. 2012. "Qualitative content analysis of online news media coverage of weight loss surgery and related reader comments." *Clinical Obesity* no. 2:125-131.
- Goldberg, J. P., and S. A. Sliwa. 2011. "Getting balanced nutrition messages across: Communicating actionable nutrition messages: challenges and opportunities " *Proceedings of the Nutrition Society* no. 70:26-37.
- Hansen, J., L. Holm, L. Frewer, P. Robinson, and P. Sandoe. 2003. "Beyond the knowledge deficit: recent research into lay and expert attitudes to food risks." *Appetite* no. 41 (2):111-121.
- Holmes, B J , N Henrich, S Hancock, and V Lestou. 2009. "Communicating with the public during health crises: experts' experiences and opinions " *Journal of Risk Research* no. 12 (6):793-807.
- Horlick-Jones, T, and A Prades. 2009. "On interpretative risk perception research: some reflections on its origins; its nature; and its possible applications in risk communication practice." *Health, Risk, & Society* no. 11 (5):409-430.
- Horlick-Jones, T, J Walls, and J Kitzinger. 2007. "Bricolage in action: learning about, making sense of, and discussing, issues about genetically modified crops and food " *Health, Risk, & Society* no. 9 (1):83-103.
- Jaspal, R, B Nerlich, and N Koteyko. 2012. "Contesting science by appealing to its norms: readers discuss climate science in the Daily Mail." *Science Communication*.
- Jensen, J D 2008. "Scientific uncertainty in news coverage of cancer research: effects of hedging on scientists' and journalists credibility " *Human Communication Research* no. 34:347-369.
- Joffe, H. 2002. "Representations of health risks: what social psychology can offer health promotion." *Health Education Journal* no. 61 (2):153-165.

- Kasperson, R E. 1992. "The social amplification of risk: progress in developing an integrative framework." In *Social theories of risk*, edited by S Krimsky and D Golding. Westport, CT: Praeger.
- Kasperson, R E , O Renn, P Slovic, Brown H S, J Emel, and R Goble. 1988. "The social amplification of risk: A conceptual framework " *Risk Analysis* no. 8:177-187.
- Kitzinger, J. 1999. "Researching risk and the media." *Health, Risk, & Society* no. 1 (1).
- Knight, T, and J Barnett. 2010. "Perceived efficacy and attitudes towards genetic science and science governance." *Public Understanding of Science* no. 19 (4):386-402.
- Krotoski, A K. 2012. "Data-driven research: open data opportunities for growing knowledge, and ethical issues that arise." *Insights* no. 24 (1):28-32.
- Laslo, E, A Baram-Tsabari, and B V Lewenstein. 2012. "A growth medium for the message: online science journalism affordances for exploring public discourse of science and ethics " *Journalism* no. 12:847-870.
- Lupton, D, and S Chapman. 1995. "'A healthy lifestyle might be the death of you': discourses on diet, cholesterol control and heart disease in the press and among the lay public " *Sociology of Health & Illness* no. 17 (4):477-494.
- Marcu, A, D Uzzell, and J Barnett. 2011. "Making sense of unfamiliar risks in the countryside: the case of Lyme disease." *Health & Place* no. 17:843-850.
- Myers, G. 2007. "Commonplaces in risk talk: face threats and forms of interaction " *Journal of Risk Research* no. 10 (3):285-305.
- Patterson, R E , J A Satia, A R Kristal, M L Neuhouser, and A Drewnowski. 2001. "Is there a consumer backlash against the diet and health message? ." *Journal of the American Dietetic Association* no. 101:37-41.
- Perez-Cueto, F J A, and W. Verbeke. 2012. "Consumer implications of the WCRF's permanent update on colorectal cancer." *Meat Science* no. 90:977-978.

- Petts, J, T Horlick-Jones, and G Murdock. 2001. *Social amplification of risk: the media and the public*. Sudbury: HSE Books.
- Renn, O, W J Burns, J X Kasperson, R E Kasperson, and P Slovic. 1992. "The social amplification of risk: theoretical foundations and empirical applications." *Journal of Social Issues* no. 48:137-160.
- Richardson, J E , and J Stanyer. 2011. "Reader opinion in the digital age: tabloid and broadsheet newspaper websites and the exercise of political voice." *Journalism* no. 12 (8):983-1003.
- Rowe, G, G Hawkes, and J Houghton. 2008. "Initial UK public reaction to avian influenza: An analysis of opinions posted on the BBC website " *Health, Risk, & Society* no. 10 (4):361-384.
- Secko, D M, S Tlalka, M Dunlop, A Kingdon, and E Amend. 2011. "The unfinished science story: Journalist-audience interactions from the *Globe and Mail's* online health and science sections." *Journalism* no. 12 (7):814-831.
- Society, British Psychological. 2013. Ethics Guidelines for Internet-mediated Research. In *INF206/1.2013*. Leicester.
- Spiegelhalter, D. 2012. *What does a 13% increased risk of death mean?* 2012 [cited 6th September 2012]. Available from <http://understandinguncertainty.org/comment/1430#comment-1430>.
- Sturgis, P, and N Allum. 2004. "Science in society: re-evaluating the deficit model of public attitudes." *Public Understanding of Science* no. 13:55-74.
- Woloshin, S, L M Schwartz, and B S Kramer. 2009. "Promoting healthy skepticism in the news: helping journalists get it right." *Journal of the National Cancer Institute* no. 101 (23):1596-1599.

Yang, J, Xu, K and Rodriguez, L. 2014. The rejection of science frames in the news coverage of the golden rice experiment in Hunan, China. *Health, Risk, & Society* 16 (4): xxx-xxx.

Figure 1: Themes and sub-themes identified for risk resistance amongst an online population



