Public health reasoning: The contribution of pragmatics

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Language users must address public health issues on a daily basis. They have to assess the health risks associated with infectious diseases, judge the safety of foods and immunizations, and gauge their likely exposure to environmental pollutants. All these scenarios are characterized by uncertainty in that they demand a high level of scientific knowledge which is more often than not lacking in the lay person. The reasoning strategies that people use to bridge gaps in their knowledge have typically been studied by psychologists. However, I will argue in this paper that linguists, and particularly those with expertise in pragmatics, have a key contribution to make to an understanding of these strategies. To this end, a group of arguments known as the informal fallacies is discussed. As their name suggests, these arguments have typically been considered by philosophers and logicians as examples of bad or shoddy reasoning. However, under a pragmatic characterization in which features of the context of use of these arguments are emphasized, these so-called fallacies are seen to facilitate reasoning about public health problems. Specifically, these arguments permit subjects to form judgements about these problems in the absence of the type of scientific knowledge that is typically the basis of formal risk assessments.

1. Introduction

The UK's Faculty of Public Health[1] defines public health as 'the science and art of promoting and protecting health and well-being, preventing ill-health and prolonging life through the organised efforts of society'. As this definition indicates, public health is a multidisciplinary domain that draws on knowledge of society in addition to the expertise embodied in scientific and medical disciplines (e.g., epidemiology, toxicology). At first sight, public health may seem strange territory indeed for academics who study language. But, as I aim to demonstrate in this article, linguists have good reason to feel particularly at home in the public health domain. This is because they have a vital contribution to make to an understanding of the cognitive (and, specifically, reasoning) processes that people use to judge public health problems and make assessments of health risks. These processes are both

mundane and highly specialized in nature. They are mundane in the sense that they permit us to make judgements on a daily basis about the health risks associated with infectious diseases (e.g., HIV, influenza), foods and immunizations (e.g., genetically modified (GM) foods and measles, mumps and rubella (MMR)), and exposure to chemicals in the environment, amongst other issues. These processes are also highly specialized in that they represent an adaptation of our rational competence to conditions of uncertainty. (These processes, it will be argued below, effectively bridge gaps in a person's knowledge.) It is the claim of this article that linguists, particularly those with knowledge of pragmatics, have an important role to play in the characterization of these processes.

The discussion will be developed along the following lines. In section 2, I examine how there is already a well-established tradition within the study of language of applying linguistic concepts, methods and theories to the investigation of health and healthcare. In section 3, the reasoning processes which, it is claimed, people use to judge public health problems are outlined and a 'pragmatic turn' in the characterization of these processes is discussed. In section 4, examples of how these processes are employed both by expert scientists and lay people in the consideration of public health problems are presented. Finally, in section 5, the impact of this area of language study on the practice of public health is considered. Additional sources are indicated throughout so that the interested reader may pursue each of these areas in more detail.

2. Language study and health

Before examining the particular contribution of pragmatics to the investigation of public health reasoning, it will be instructive to step back and take a broader view of the contribution of language study to the health domain. What one finds are diverse applications of language study to aspects of health and to healthcare services. Chief among these applications is the use of linguistic concepts and theories to characterize speech and language disorders in children and adults. Health communication in all its forms has attracted the interest of language researchers. With a growing number of people turning to internet resources for health advice and information, online health communication has recently emerged as an area of increasing significance for linguists. Discourse analysis and conversation analysis have contributed valuable insights to an understanding of a range of interactions which take place between doctors and their patients. This list is by no means exhaustive of the different ways in which language study has been applied to the health domain. Yet, some elaboration of these ways will serve to demonstrate that public health reasoning is simply a recent addition to what is already a vibrant area of health-related research in language study.

Linguistics is a foundational discipline of the field of speech-language pathology (Cummings, 2008, 2014a). Each branch of this discipline contributes to our understanding of the different ways in which speech and language can be impaired in children and adults. In this way, phonetics and phonology help clinicians to characterize disordered speech in the child with a cleft palate. Morphology and syntax are essential to an understanding of morphosyntactic deficits in children with specific language impairment. Semantics helps researchers characterize naming errors and other semantic deficits in adults with aphasia. Clinicians look to pragmatics and discourse in order to describe the significant communication impairments of clients with autism spectrum disorder, dementia and schizophrenia (see Cummings (2013a) for further discussion). Aside from the characterization of speech and language disorders, linguistics makes a further contribution to our understanding of communication disorders through its development of theories. For example, optimality theory has gains over a process-based approach to phonology in the clinical management of phonological disorder in children, while relevance theory offers an explicit account of a range of pragmatic disorders in children and adults (see Cummings (2013b) for further discussion).

Health communication is a broad field which draws on insights from psychology, communication (interpersonal and mass media), social marketing, health education and linguistics, among other areas. The contribution of language study to health communication is wide ranging, as a recently published book aptly demonstrates. Harvey and Koteyko (2012) discuss spoken, written and computer-mediated health communication, with topics including doctor-patient encounters, the patient information leaflet and online advice from health professionals. Language researchers have routinely employed discourse analysis and conversation analysis in studies of health-related communication in medical and non-medical contexts. Examples include the examination of reported speech in shift handovers in nursing units (Bangerter et al., 2011), the reporting of test results during medical consultations (Pomerantz and Rintel, 2004), the use of affiliative turns during general practice consultations (Ruusuvuori, 2007) and the posting of messages to an internet discussion forum about depression (Morrow, 2006). Aside from health communication, discourse analysis and conversation analysis have also been used to assess and treat communication pathologies in a range of clinical disorders, including the deviant discourse of clients with schizophrenia and adults with dementia, and conversational interactions between aphasic adults and their spouses (see chapter 6 in Cummings (2009a) for discussion).

It emerges that the contribution of language study to the investigation of issues in the health domain is already well established. It is against this

backdrop that my own work on public health reasoning is situated. Public health is a collective effort which involves the input of many actors in the improvement of human health in all its forms across different sections of society. These actors consist, most notably, of health professionals and members of the public, but can also include statisticians, environmental scientists and communication specialists. These various parties to the public health pact often differ markedly in terms of their cognitive skills and practical resources. The medical epidemiologist, for example, has a very different understanding of an infectious disease epidemic from that of the lay person. And the lay person must assess health advice from medical experts against practical constraints which include financial resources and time limitations (e.g., the advice to take three hours of cardiovascular exercise a week may not be perceived by everyone to be feasible).

It is the asymmetry in cognitive skills and practical resources between these different actors which lies at the heart of a number of failed public health interventions over the years, including misguided advice about the safety of British beef in the 1980s and 1990s, and the drastic reduction in MMR immunization following concerns about the safety of the vaccine first expressed in 1998.[2] One means of addressing this asymmetry, I contend, is to examine the reasoning processes which different actors bring to deliberations about public health problems. In a series of publications, I have undertaken such an examination, principally in relation to the reasoning of members of expert scientific committees during the UK's BSE crisis (Cummings, 2002, 2004, 2005, 2009b, 2010a, 2011, 2012a, 2012b, 2012c). The combined aim of these studies is to develop a rational methodology in which the informal fallacies function as cognitive heuristics in public health reasoning. It is the specific role of these heuristics to bridge 'cognitive gaps' which arise from a lack of knowledge or certainty. It is in the achievement of this aim, I will argue below, that pragmatics plays a central role.

3. Informal fallacies: historical context and the 'pragmatic turn'

The arguments which have been integral to my work on public health reasoning are known by the term 'informal fallacies'. Although there has not always been agreement on the arguments which constitute these fallacies, a consensus of sorts has emerged on the typical members of this group. Among the so-called 'gang of eighteen' informal fallacies are the argument from ignorance, question-begging argument and the argument from authority.[3] As the word 'fallacies' suggests, these arguments have not always been held in high regard by the philosophers and logicians who have studied them. In fact, prior to the pioneering work of Charles Hamblin, these arguments were widely held to be examples of bad or shoddy reasoning. In his book *Fallacies*, Hamblin (1970) railed against the 'standard treatment'[4] of the fallacies in

both historical and (then) contemporary logic texts. Hamblin's criticism transformed the study of this group of arguments from a somewhat neglected area of logical enquiry to one which warranted the same systematic treatment afforded to other branches of logic. New analyses of the informal fallacies swiftly followed. These analyses attempted to explain for the first time the logical or other flaws of these arguments in terms of theoretical models. Many of these models (e.g., Mackenzie, 1985) drew directly on the dialogical framework outlined by Hamblin.[5]

While Hamblin's criticism ushered in a new, systematic treatment of the fallacies, the emphasis of this treatment was still largely on viewing these arguments as aberrations or flaws in reasoning. As such, some means needed to be found of proscribing these arguments. Within a dialogical framework, this was achieved through the use of rules of dialogue which effectively blocked certain question and answer sequences. In demonstration of these rules, consider the following question-and-answer dialogue between John and Mary:

> John: Why P?
> Mary: Statement Q, and Q implies P
> John: Why Q?
> Mary: Statement P, and P implies Q

This dialogue sequence is unlikely to be satisfactory to John. The reason he will find it unsatisfactory is that Mary has used statement P, which John does not accept, as a means of justifying that statement. This is essentially the logical flaw of a question-begging argument – an arguer does not present grounds which are independent of the conclusion-to-be-proved and instead merely 'begs' for the conclusion. If Mary wants to secure John's acceptance of statement P, she needs to use as logical grounds some statement other than P to which John is already committed. Fallacy theorists of a dialogical bent prohibit a dialogue sequence such as that between John and Mary through the use of rules such as Mackenzie's rule R_{chall} (1979: 121). This rule states that:

After 'Why P?', the next event must be either

   (i) 'No commitment P'; or

   (ii) The resolution demand of an immediate consequence conditional whose consequent is 'P' and whose antecedent is a conjunction of statements to which the challenger is committed (e.g., A, B and C imply P); or

   (iii) A statement not under challenge with respect to its speaker (i.e., a statement to whose challenge its hearer is not committed).

R$_{chall}$ effectively blocks Mary's second turn in the above dialogue – Mary cannot respond to John's question 'Why Q?' with the statement P for the reason that P is under challenge with respect to Mary from John's question 'Why P?' at the outset of the dialogue. A quite different rule of dialogue prohibits another informal fallacy known as the argument from ignorance. Within a dialogical framework, this fallacy is represented as an illicit shifting of the burden of proof between arguers of the type demonstrated in the exchange below between John and Mary:

>   John: Why A?
>   Mary: Why not-A?

It is Mary's role in the above exchange either to justify her acceptance of A or to state that she has no commitment to A. What Mary cannot do is subvert the normal burden of proof rules in a dialogical exchange by asking John to defend not-A. To the extent that John is unable to bring forward evidence to support not-A, there is a presumption in favour of the truth of A: there is *no evidence* that not-A is true, therefore not-A is false (i.e., A is true). This statement captures the essence of an ignorance argument in that one argues from a lack of knowledge or evidence of the truth (falsity) of a proposition to the falsity (truth) of that proposition. It is exactly this dialogical exchange between John and Mary that Hamblin's rule S3 is designed to block. In Hamblin's Why-Because-System-with-Questions (1970: 265), rule S3 states that:

>   "Why A?" must be followed by
>   (a) "Statement not-A"
>   or (b) "No commitment A"
>   or (c) "Statement B, where B is equivalent to A"
>   or (d) "Statements 'B, B implies A', for any B".

This rule prevents Mary from responding to John's question 'Why A?' with 'Why not-A?', as this response is a question and not a statement or a denial of commitment to A as is ordained by S3.

In a post-Hamblin era, dialogical frameworks found increasingly complex and formal ways to prohibit a range of fallacious arguments. But an assumption of these frameworks that largely went unchallenged is that there is something inherently flawed about informal fallacies like the argument from ignorance which necessitates their proscription in most or all contexts. Although logicians had conceded that certain informal fallacies had rationally warranted variants in highly restricted contexts,[6] the possibility that these non-fallacious variants might be a more widespread logical phenomenon was

not given serious consideration until the work of two Canadian logicians, John Woods and Douglas Walton. In a large series of studies over many years, Woods and Walton have analysed non-fallacious variants of most (or all) of the informal fallacies including the argument from ignorance, question-begging argument and ad baculum arguments (or appeal to force) (Walton, 1985, 1992; Woods, 1995, 2004). What these and other studies (e.g., Cummings, 2000) revealed is that many of the informal fallacies appear to be not so fallacious after all when assessed against the argumentative contexts in which they are advanced. Below is how Walton captures this point in relation to the argument from ignorance:

> '[T]he *ad ignorantiam* argument is not always fallacious, and it is misleading to call it a fallacy [...] the *ad ignorantiam* is a plausible, if weak, form of reasoning, depending on the context [...] the burden of proof varies from one context of dialogue to another. So it is the context of dialogue that can make an *ad ignorantiam* argument plausible or implausible in a given case.' (Walton, 1989: 45, 47)

With context afforded for the first time a central role in fallacy analysis, theorists gradually began to abandon the idea that certain arguments are inherently weak or flawed, or are somehow fallacious 'in themselves'. When assessed against the purposes and goals for which they were advanced, many informal fallacies were found to have previously unrecognized rational merits. It was not long before this shift in emphasis in fallacy analysis found a conceptual bedfellow in pragmatics. Where the terminology of formal (deductive) logic had once dominated discussion of the fallacies, informal logic texts began to use expressions such as 'logical pragmatics' and 'linguistic pragmatics'. Irrespective of terminology, the thrust of this pragmatic approach was on the *uses* to which arguments are put:

> 'Only recently has it become apparent that a pragmatic approach is absolutely necessary in order to make sense of informal fallacies [...] If the study of fallacies is to be part of logic, clearly logic can make no headway in working towards its primary goal unless the pragmatic study of the uses of reasoning in argument (informal logic) is included as a legitimate part of the subject.' (Walton, 1990: 419)

This 'pragmatic turn' in the study of fallacies has received its most explicit treatment in the pragma-dialectical approach of Frans van Eemeren and Rob Grootendorst (1984, 1995, 2004). Although an extended examination of this approach is not possible in the present context – the reader is referred to Cummings (2010b) for further discussion – some consideration of its main influences and features is necessary in order to make good its claim to be a

linguistic pragmatic framework. According to Van Eemeren and Grootendorst, the study of argument should be centrally located within linguistic pragmatics: 'The study of argumentation should [...] be construed as a special branch of linguistic pragmatics in which descriptive and normative perspectives on argumentative discourse are methodically integrated' (1995: 131). This 'special branch' is noteworthy for its integration of the theory of speech acts of Austin (1962) and Searle (1969, 1979) with Grice's theory of rational verbal exchanges (Grice, 1975, 1989):

> 'An integration of Searlean communicative insight and Gricean interactional insight offers, in our view, the best starting-point for approaching argumentative discourse and texts' (Van Eemeren and Grootendorst, 2004: 76).

In pragma-dialectics, speech acts are connected systematically with the rules for a critical discussion. The aim of these rules is to resolve a difference of opinion between disputants (known as the protagonist and antagonist). A participant in argumentative discussion is only rational to the extent that he contributes speech acts which observe these rules. Any speech act which violates one of the critical discussion rules frustrates the aim of resolution, and is the basis of a fallacy:

> 'Any infringement of one or more of the rules, whichever party commits it and at whatever stage in the discussion, is a possible threat to the resolution of a difference of opinion and must therefore be regarded as an incorrect discussion move. In the pragma-dialectical approach, fallacies are analysed as such incorrect discussion moves in which a discussion rule has been violated' (Van Eemeren and Grootendorst, 1995: 136).

Returning to the argument from ignorance, this fallacy is committed when a rule at the opening stage or a rule at the closing stage of a critical discussion is violated. The former rule (rule 2 in Van Eemeren and Grootendorst's framework) requires the party who advances a standpoint to defend it if the other party asks him to do so: 'Rule 2 can be violated – at the opening stage – by the protagonist by evading or shifting the burden of proof [...] In the second case [shifting the burden of proof], the protagonist challenges the opponent to show that the protagonist's standpoint is wrong (special variant of *argumentum ad ignorantiam*) or that the opposite standpoint is right' (Van Eemeren and Grootendorst, 1995: 139). The latter rule (rule 9 in the pragma-dialectical framework) prohibits making an absolute of the success of the defence (on the part of the protagonist) and making an absolute of the failure of the defence (on the part of the antagonist):

> 'Rule 9 can be violated - at the closing stage - by the protagonist by concluding that a standpoint is true just because it has been successfully defended (making an absolute of the success of the defense) or by the antagonist by concluding from the fact that it has not been proved that something is the case, that it is not the case, or from the fact that something has not been proved not to be the case, that it is the case (making an absolute of the failure of the defense or special variant of *argumentum ad ignorantiam*)...' (Van Eemeren and Grootendorst, 1995: 141).

According to Van Eemeren and Grootendorst, a pragma-dialectical analysis of the fallacies is both more systematic and more refined than the standard treatment's analysis of the fallacies: more systematic, in that *ad hoc* explanations of the fallacies are replaced by a framework in which all the fallacies fall under one or more rules for a critical discussion; more refined, in that fallacies lumped together in the standard treatment are either shown to have something in common or are clearly distinguished, while other fallacies which are genuinely related but once separated are brought together. This is not the context in which to pursue this issue (see Woods (1991) for further discussion). For my own part, I have argued that a cognitive reorientation of this pragma-dialectical framework is necessary if the arguments which we have been examining in this section are to shed light on the rational strategies that people bring to the assessment of public health problems. It is to an examination of these strategies that we now turn.

4. Informal fallacies as cognitive heuristics in public health

The starting point for my work on the informal fallacies is that some variants of these arguments are not only non-fallacious, but actually have cognitive benefits in the context of deliberations about complex scientific issues such as those found in public health. These benefits can be broadly characterized as facilitating risk assessments and other forms of decision-making when knowledge of a scientific issue is lacking or is otherwise beyond the cognitive grasp of the lay person. The function of these fallacies is, thus, to bridge gaps in our knowledge. In such scenarios, these arguments serve as cognitive heuristics or quick 'rules of thumb' which lead cognitive agents to a conclusion (in the public health case, an assessment of risk) in a relatively fast and frugal way. Their qualities of speed and cognitive efficiency derive from the fact that they bypass a more systematic consideration of evidence and knowledge in a particular domain. In cases where this evidence and knowledge are lacking, as it is when scientists are confronted with a new disease or members of the public lack a detailed understanding of a public health issue, there is perhaps little to be bypassed – heuristic reasoning

becomes the dominant form of reasoning by default. This view of the fallacies is also pragmatic through and through – even though it does not subscribe to the pragma-dialectical approach of Van Eemeren and Grootendorst – on account of its emphasis on context in determining when a fallacy is used as a cognitive heuristic (and is, thus, non-fallacious) or is used as a weak, shoddy or deceptive form of argument (and is, thus, fallacious). This is aptly demonstrated by returning to the argument from ignorance, a type of argument that was used so extensively during the UK's BSE crisis that Lord Phillips, the chairman of the public inquiry into the disease, described it as the 'mantra' of the BSE affair. Below are three examples of the argument from ignorance which assumed prominence during this animal disease epidemic:

> A: There is *no evidence* that scrapie in sheep has transmitted to humans.[7]
>   Therefore, scrapie in sheep has *not* transmitted to humans.
> B: There is *no evidence* that BSE is a zoonosis.[8]
>   Therefore, BSE is *not* a zoonosis.
> C: There is *no evidence* that beef is unsafe.
>   Therefore, beef is *not* unsafe (i.e., beef is safe).

Each of these arguments has the form of a classic argument from ignorance: an arguer reasons from a *lack of evidence* that P is the case (where P stands for a proposition) to the conclusion that P is *not* the case. Notwithstanding their identical logical structure, these arguments have very different rational merits, so much so in fact that the argument in A is non-fallacious, while the arguments in B and C are both fallacious. To see this, considerable context must be supplied. The argument in A was used as a conclusion to large-scale epidemiological work by Brown et al. (1987), only months after the first cases of BSE appeared in British cattle in November 1986. Brown et al.'s study concluded a 15-year investigation of Creutzfeldt-Jakob disease (CJD) in France and reviewed the world literature on the epidemiology of scrapie and CJD, and found no evidence of a link between scrapie in sheep and CJD in humans. The reason this conclusion had considerable resonance for the BSE crisis was that the failure of scrapie to transmit to humans was used by scientists and government ministers alike to argue that BSE too would not transmit to humans (BSE, it was argued, would behave like scrapie and not transmit to humans).

Notwithstanding the erroneous use of Brown et al.'s conclusion by various actors in the BSE affair, the argument from ignorance which gave rise to it was, in fact, rationally warranted. The rational warrant of this argument stemmed from the fact that scrapie had been endemic in the sheep population of Britain for some 250 years by the time BSE emerged in cattle. Given this passage of time and the fact that numerous investigations had attempted to

search for a link between scrapie in sheep and CJD in humans, the fact that no such link could be found was indeed reasonable grounds for concluding that it did not exist. The argument in A satisfied the two conditions which make for a rationally warranted argument from ignorance – after some 250 years of experience with scrapie, the knowledge base on this disease was closed (*epistemic closure*) and had been extensively searched in a review of the world literature (*exhaustive search*).

These same conditions of epistemic closure and exhaustive search were not satisfied in the case of the arguments in B and C. Both these arguments were repeatedly advanced by government ministers, beef industry representatives and even some scientists from the earliest days of the BSE epidemic. Yet, given the lengthy incubation period of the group of diseases to which BSE belongs – transmissible spongiform encephalopathies were known in 1986 to have incubation periods running in some cases to several decades – claims to the effect that there was *no evidence* that BSE is a zoonosis or that beef is unsafe at the outset of this epidemic had no rational force whatsoever (compare with the 250 years of experience with scrapie in sheep). There could be no epistemic closure or exhaustive search of a knowledge base on BSE which was only beginning to be established in the late 1980s. Viewed in this context, conclusions based on claims of 'no evidence' were decidedly weak and fallacious.

So, arguments from ignorance were used fallaciously and non-fallaciously by scientists and others during the BSE epidemic. In Cummings (2010a), I argued that non-fallacious variants of these arguments conferred certain benefits on the inquiry into BSE upon which scientists were engaged. Firstly, these arguments permitted scientists to make progress in this inquiry at a time when little was known about the BSE pathogen. Scientists were able to transform their *lack of knowledge* about the disease into a series of claims to the effect that something *is* or *is not* the case (e.g., BSE is *not* a zoonosis). These latter claims permitted scientists to move forward in inquiry rather than adopt a policy of inaction in the absence of knowledge. Secondly, non-fallacious ignorance arguments generated propositions which BSE scientists were able to use in other reasoning and decision-making. For example, the conclusion of argument A above – scrapie in sheep has not transmitted to humans – was used subsequently by scientists in analogical reasoning as part of their risk assessments about BSE:

> *Analogical argument:*
> BSE and scrapie are similar in certain respects.
> Scrapie has not transmitted to humans.
> Therefore, BSE will not transmit to humans.

The fact that the conclusion of this analogical argument was shown by later events to be erroneous does not negate the rational merits of the argument which produced this conclusion. These epistemic benefits of the argument from ignorance were the basis for the claim in Cummings (2010a) that this argument functioned, on certain occasions at least, as a cognitive heuristic for the scientists who were charged with responding to BSE. In later work, I have demonstrated that lay people, like expert scientists, are also aware of the epistemic conditions under which arguments from ignorance (and a number of other informal fallacies) are more or less rationally warranted. In a large-scale, questionnaire-based survey of 879 members of the public, it was shown that ignorance, analogical, circular and authority arguments were selectively accepted and rejected by respondents as specific epistemic conditions were varied during a task in which participants were asked to make assessments of public health problems (Cummings, 2013c, 2013d, 2014b, 2014c, 2014d, 2014e, 2014f). The public health implications of these findings are substantial. It is to this issue that we now turn.

5. The public health impact of a pragmatic reorientation of the fallacies

It emerges that expert scientists and members of the public make use of similar rational procedures in their assessment of public health problems, notwithstanding significant differences in their knowledge and technical expertise. This finding has important implications for how public health is practiced. Public health can only be effectively conducted if a pact exists between the practitioners in this field and members of the public. This pact takes the form of a commitment between both parties to the effect that public health practitioners must act in the best interests of the public's health. For its part, the public must trust public health practitioners to protect its health and, importantly, must cooperate with these practitioners in achieving this goal. In an ideal world, this pact would motivate every public health intervention. However, too often in practice it is violated, with abuses ranging from incomprehensible and contradictory communications by public health practitioners to distrust and a lack of compliance by members of the public. In Cummings (2010a), I argued that a better understanding of the cognitive strategies that are used by expert scientists and members of the public in assessing public health problems might serve as a valuable corrective to these various violations of the public health pact. The specific cognitive strategies which are best suited to this task, I believe, are those represented by the informal fallacies discussed in this article.

Public health communication stands to gain most from the reasoning strategies which have been examined in the present context. These strategies clearly hold rational sway for both the expert scientist who is conducting risk assessments in the public health domain, and for the lay person who is

attempting to assess his or her personal level of risk in a situation. To this extent, it follows that public health professionals should attempt to harness these strategies in framing public health messages. Many public health communications use 'no evidence' statements, for example, as a means of allaying anxiety or of simplifying a health issue for the lay person who is perceived by experts to have limited knowledge and understanding. If the results of my work in this area demonstrate anything, it is that lay people can and do use the same rational strategies to assess public health issues as expert scientists, and largely with the same purpose in mind – to bridge a lack of scientific knowledge. The undeniable lack of scientific knowledge of the lay person is too often confused by public health professionals with the lack of a rational capacity to assess evidence and to arrive at judgements about problems. This has led to a tendency on the part of these professionals to withhold the evidence which forms the rational basis of health advice and other interventions. A form of public health communication, which encourages the lay person to exercise rational judgement in an assessment of risk, can counter a paternalistic approach to public health and may result in greater public engagement in a range of health interventions.

Of course, the application of the informal fallacies to the public health domain is only possible on account of the pragmatic reorientation of these fallacies. This reorientation has taken these arguments from a historically neglected area of logic through to their role as cognitive heuristics in reasoning. This transition has seen the fallacies shed their largely negative characterization as logical flaws or weaknesses and assume a more positive characterization based on their epistemic features in specific argumentative contexts. When assessed in these contexts, these arguments no longer appear quite so fallacious and have previously unrecognized rational merits. Scientific inquiry into BSE is one context in which the fallacies were found to have non-fallacious variants which directly facilitated the progress of this inquiry. (This is not to overlook, of course, the many fallacious uses of these arguments during the same inquiry.) More generally, the domain of public health presents many occasions in which the facilitative effects of these arguments can be observed. The pragmatic reorientation of the fallacies has still not resulted in pragmatic frameworks of these arguments which are entirely satisfactory. The pragma-dialectical approach of Van Eemeren and Grootendorst, for example, was only capable of capturing some of the arguments that were identified in Cummings (2010a) as central to the inquiry into BSE. It is towards the development of these frameworks that future research should be directed.

6. Conclusion

This chapter has examined the contribution of pragmatics to the analysis of a

group of arguments which, it was claimed, play a significant role in public health reasoning. These arguments – the so-called informal fallacies – were found to confer a number of gains on reasoning when evaluated within the particular contexts in which they were advanced. Although a pragmatic reorientation of the fallacies has proceeded apace, the development of satisfactory pragmatic frameworks of these arguments has lagged somewhat behind. The next chapter in the story of the informal fallacies will surely be the development of pragmatic frameworks which are equipped to characterize the rational merits of these arguments in public health and other contexts.

Notes

1. The Faculty of Public Health is the standard setting body for specialists in public health in the United Kingdom. It is a joint faculty of the Royal Colleges of Physicians in London, Edinburgh and Glasgow and is the professional home for more than 3,000 people working in public health.

2. These concerns were raised by Andrew Wakefield and colleagues in an article which appeared in *The Lancet* (Wakefield et al., 1998). These investigators examined a consecutive series of 12 children with chronic enterocolitis and pervasive developmental disorder. The onset of behavioural symptoms in 8 of the 12 children was associated, by the parents, with MMR vaccination. The ensuing public anxiety about the safety of the MMR vaccine caused a sharp reduction in the number of parents who consented to vaccination of their children.

3. Woods et al. (2004) list the members of the 'gang of eighteen' as: ad baculum; ad hominem; ad misericordiam; ad populum; ad verecundiam; ad ignorantiam; post hoc, ergo propter hoc; affirming the consequent; denying the antecedent; begging the question; equivocation; amphiboly; hasty generalization; biased statistics; composition and division; faulty analogy; gambler's fallacy; ignoratio elenchi.

4. Hamblin (1970: 12) challenged the standard treatment of the fallacies in logic texts in the following terms: 'And what we find in most cases, I think it should be admitted, is as debased, worn-out and dogmatic a treatment as could be imagined – incredibly tradition-bound, yet lacking in logic and historical sense alike, and almost without connection to anything else in modern logic at all. This is the part of his book in which a writer throws away logic and keeps his reader's attention, if at all, only by retailing traditional puns, anecdotes, and witless examples of his forbears'.

5. As the following comments indicate, Mackenzie was directly influenced by Hamblin to pursue a dialogical analysis of the fallacies: '...the study of dialogue should be the context within which we consider any logical question. This I take to be the position of Hamblin and of the tradition of dialogical inquiry initiated by him' (Mackenzie, 1985: 329). Mackenzie (1985) sees his own formulation of 'a dialogical system designed to explain the fallaciousness of question-begging arguments, as a contribution toward this [Hamblin's] project' (329).

6. For example, in relation to the argument from ignorance, the logician Irving Copi observed that 'this mode of argument is not fallacious in a court of law, because there the guiding principle is that a person is presumed innocent until proven guilty' (1961: 57), and that 'the defense can legitimately claim that if the prosecution has not proved guilt, this warrants a verdict of not guilty' (1972: 77).

7. Scrapie is a transmissible spongiform encephalopathy (TSE) in sheep, in the same way that BSE is a TSE in cattle and CJD is a TSE in humans.

8. A zoonosis is any disease which passes to man from a lower vertebrate (sheep, cows, etc.).

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References

Austin, J. L. (1962). *How to do things with words*. Oxford: Clarendon Press.

Bangerter, A., Mayor, E., & Doehler, S. P. (2011). Reported speech in conversational storytelling during nursing shift handover meetings. *Discourse Processes*, *48*(3), 183-214.

Brown, P., Cathala, F., Raubertas, R. F., Gajdusek, D. C., & Castaigne, P. (1987). The epidemiology of Creutzfeldt-Jakob disease: Conclusion of a 15-year investigation in France and review of the world literature. *Neurology*, *37*(6), 895-904.

Copi, I. M. (1961). *Introduction to logic* (2nd ed.). New York: Macmillan.

Copi, I. M. (1972). *Introduction to logic* (4th ed.). New York: Macmillan.

Cummings, L. (2000). Petitio principii: The case for non-fallaciousness. *Informal Logic*, *20*(1), 1-18.

Cummings, L. (2002). Reasoning under uncertainty: The role of two informal fallacies in an emerging scientific inquiry. *Informal Logic*, *22*(2), 113-136.

Cummings, L. (2004). Analogical reasoning as a tool of epidemiological investigation. *Argumentation*, *18*(4), 427-444.

Cummings, L. (2005). Giving science a bad name: Politically and commercially motivated fallacies in BSE inquiry. *Argumentation*, *19*(2), 123-143.

Cummings, L. (2008). *Clinical linguistics*. Edinburgh: Edinburgh University Press.

Cummings, L. (2009a). *Clinical pragmatics*. Cambridge: Cambridge University Press.

Cummings, L. (2009b). Emerging infectious diseases: Coping with uncertainty. *Argumentation*, *23*(2), 171-188.

Cummings, L. (2010a). *Rethinking the BSE Crisis: A study of scientific reasoning under uncertainty*. Dordrecht: Springer.

Cummings, L. (2010b). Pragma-dialectics. In L. Cummings (Ed.), *Routledge Pragmatics Encyclopedia*, (pp. 337-338). London and New York: Routledge.

Cummings, L. (2011). Considering risk assessment up close: The case of bovine spongiform encephalopathy. *Health, Risk & Society*, *13*(3), 255-275.

Cummings, L. (2012a). The contribution of informal logic to public health. *Perspectives in Public Health*, *132*(2), 66-67.

Cummings, L. (2012b). Scaring the public: Fear appeal arguments in public health reasoning. *Informal Logic*, *32*(1), 25-50.

Cummings, L. (2012c). The public health scientist as informal logician. *International Journal of Public Health*, *57*(3), 649-650.

Cummings, L. (2013a). Clinical linguistics: A primer. *International Journal of Language Studies*, *7*(2), 1-30.

Cummings, L. (2013b). Clinical linguistics: State of the art. *International Journal of Language Studies*, *7*(3), 1-32.

Cummings, L. (2013c). Circular reasoning in public health. *Cogency*, *5*(2), 35-76.

Cummings, L. (2013d). Public health reasoning: Much more than deduction. *Archives of Public Health*, *71*(1), 25.

Cummings, L. (2014a). *Communication disorders*. Houndmills, Basingstoke: Palgrave Macmillan.

Cummings, L. (2014b). Informal fallacies as cognitive heuristics in public health reasoning. *Informal Logic*, *34*(1), 1-37.

Cummings, L. (2014c). Coping with uncertainty in public health: The use of heuristics. *Public Health*, *128*(4), 391-394.

Cummings, L. (2014d). Analogical reasoning in public health. *Journal of Argumentation in Context*, *3*(2), 169-197.

Cummings, L. (2014e). Circles and analogies in public health reasoning. *Inquiry*, *29*(2), 35-59.

Cummings, L. (2014f). The 'trust' heuristic: Arguments from authority in public health. *Health Communication*, *29*(10), 1043-1056.

Grice, H. P. (1975). Logic and conversation. In P. Cole & J. Morgan (Eds.), *Syntax and Semantics 3: Speech Acts*, (pp. 41-58). New York: Academic Press.

Grice, H. P. (1989). *Studies in the way of words*. Cambridge, MA: Harvard University Press.

Hamblin, C. L. (1970). *Fallacies*. London: Methuen.

Harvey, K., & Koteyko, N. (2012). *Exploring health communication*. London and New York: Routledge.

Mackenzie, J. D. (1979). Question-begging in non-cumulative systems. *Journal of Philosophical Logic*, *8*(1), 117-133.

Mackenzie, J. D. (1985). No logic before Friday. *Synthese*, *63*(3), 329-341.

Morrow, P. R. (2006). Telling about problems and giving advice in an internet discussion forum: Some discourse features. *Discourse Studies*, *8*(4), 531-548.

Pomerantz, A., & Rintel, E. S. (2004). Practices for reporting and responding to test results during medical consultations: Enacting the roles of paternalism and independent expertise. *Discourse Studies*, *6*(1), 9-26.

Ruusuvuori, J. (2007). Managing affect: Integration of empathy and problem-solving in health care encounters. *Discourse Studies*, *9*(5), 597-622.

Searle, J. R. (1969). *Speech acts: An essay in the philosophy of language*. Cambridge: Cambridge University Press.

Searle, J. R. (1979). *Expression and meaning: Studies in the theory of speech acts*. Cambridge: Cambridge University Press.

Van Eemeren, F. H., & Grootendorst, R. (1984). *Speech acts in argumentative discussions: A theoretical model for the analysis of discussions directed towards solving conflicts of opinion*. Dordrecht: Foris Publications.

Van Eemeren, F. H., & Grootendorst, R. (1995). The pragma-dialectical approach to fallacies. In H. V. Hansen & R. C. Pinto (Eds.), *Fallacies: Classical and Contemporary Readings*, (pp. 130-144). University Park, PA: The Pennsylvania State University.

Van Eemeren, F. H., & Grootendorst, R. (2004). *A systematic theory of argumentation: The pragma-dialectical approach*. Cambridge: Cambridge University Press.

Wakefield, A. J., Murch, S. H., Anthony, A., Linnell, J., Casson, D. M., Malik, M., Berelowitz, M., Dhillon, A. P., Thomson, M. A., Harvey, P., Valentine, A., Davies, S. E., & Walker-Smith, J. A. (1998). Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children. *The Lancet*, *351*(9103), 637-641.

Walton, D. N. (1985). Are circular arguments necessarily vicious? *American Philosophical Quarterly*, *22*(4), 263-274.

Walton, D. N. (1989). *Informal logic: A handbook for critical argumentation*. Cambridge: Cambridge University Press.

Walton, D. N. (1990). What is reasoning? What is an argument?. *Journal of Philosophy*, *87*(8), 399-419.

Walton, D. N. (1992). Nonfallacious arguments from ignorance. *American Philosophical Quarterly*, *29*(4), 381-387.

Woods, J. (1991). Pragma-dialectics: A radical departure in fallacy theory. *Communication and Cognition*, *24*(1), 43-54.

Woods, J. (1995). Appeal to force. In H. V. Hansen & R. C. Pinto (Eds.), *Fallacies: Classical and Contemporary Readings*, (pp. 240-250). Pennsylvania: The Pennsylvania State University Press.

Woods, J. (2004). *The death of argument: Fallacies in agent-based reasoning*. Dordrecht: Kluwer Academic Publishers.

Woods, J., Irvine, A., & Walton, D. (2004). *Argument: Critical thinking, logic and the fallacies* (2nd ed.). Toronto: Prentice Hall.