More than 30 years of research on sustainable food and agriculture in Denmark has not, in general, led to more sustainable systems of production and consumption. To give some examples, the pesticide treatment frequency has been growing for the past 15 years and the environmental impact of pesticides has doubled from 2007 to 2012 (Noe and Alrøe 2015), landscape quality is (again, after a period of some restoration) deteriorating by the removal of hedges and small biotopes to gain more workable fields (Brandt et al. 2014, see also Street 2015), subsoil is threatened by permanent compaction by the use of still larger machinery (Schjønning et al. 2015), biodiversity has been falling since 1990 (Normander et al. 2009), and the target to halt biodiversity loss by 2010 has not been met (Ejrnæs et al. 2011).

WHY DOES MORE SCIENCE NOT LEAD TO MORE SUSTAINABLE DEVELOPMENT?

Why has the strong focus on sustainability not, in general, led to more sustainable production systems? From the perspective of social systems theory, there are some paradoxes involved that may help explain this. A fundamental paradox is the fact that scientific advice is increasingly called upon by governments and other bodies in modern democracies, yet at the same time the authority of science is questioned as never before (Bijker et al. 2009). Specifically, knowledge asymmetries in the production of scientific knowledge can lead to the paradox of scientific expertise: that the growth of knowledge entails a fragmentation of knowledge due to the differentiation of scientific perspectives (Alrøe and Noe 2011). With regard to sustainable development of agriculture and food, the key semantic of sustainability is attached to a paradoxical observation perspective, in the sense that this semantic so to speak wishes to take the whole into consideration. Since this is not possible, the semantic of sustainability has to connect to a multitude of specialized perspectives and therefore has to remain indeterminate (Noe and Alrøe 2015). Furthermore, the operational closure and the observational blindness of both research systems and farming systems can lead to knowledge gaps that hinder implementation of research knowledge in practice (Noe et al. 2015).

Following the recent focus on epistemic issues in evidence-based policy as an important nexus of the geography of expertise and the “play of governance” in modern societies (Wackers and Markussen 2015), this paper investigates the hypothesis that the growing number of available scientific perspectives (such as different disciplines, research approaches and schools of thought) are used as conflicting perspectives in tactical games of debate in society. Very little is known about how policy actors perceive and experience evidence tools in the complex and contested world of policy making. However, Stewart and Smith (2015) argue that the utility of such research-informed tools lies primarily in their symbolic value as a marker of good (evidence-informed and transparent) decision making, and that their roles within policy debates are therefore to some extent performative.

1 Updated version of a paper presented at the conference Conflicting Systems - Observed with Social systems Theory, 14.-18. September 2015, IUC, Dubrovnik, Croatia.
This is a serious and growing challenge for democracy, since the rules and norms of democratic debate are constructed to handle conflicting interests within a rational frame of discussion, whereas they are blind to conflicting perspectives that operate by different logics and see the world differently. The democratic debates therefore deteriorate to democratic conflicts. According to this thesis, the different strands of sustainability research only add to this fragmentation and thereby to the options for using different perspectives in the tactical games of democratic debate.

There are many current examples that reflect on the use of science in public debate, and which illustrate this challenge. A first example is a recent cover story in *National Geographic* entitled “The war on science”, which refers to climate change, evolution, the moon landing, vaccinations and GMO food (Aschenbach 2015): “The age of disbelief: Skepticism about science is on the rise, and polarization is the order of the day. What’s causing reasonable people to doubt reason?” As the quote shows, this article does not challenge the belief that science will eventually find the truth and that there is only one scientific truth. Disbelief in science is based on ignorance or vested interests. For science, this is a “science communication problem”, because people tend to use scientific knowledge to reinforce beliefs that have already been shaped by their world views and peers, and because the internet enables people to find the information that fits them. Sometimes, like in the US debate on climate change, the goal is not to win the debate but merely “to fog the room enough to keep laws governing greenhouse gas emission from being enacted”.

A second example is a recent cover story in *New Scientist* where environmental psychologist Robert Gifford (2015) lists 33 different reasons why we fail to act despite growing evidence of climate change. Among these 33 reasons are Ignorance, Uncertainty, Confirmation bias, World views, Conflicting goals, values and aspirations, Mistrust and Denial, which all relate to the use of science. There is some recognition of the lobbying problem we referred to above: “ignorance also stems from disciplined and deliberate attempts by groups with a vested interest in the production and use of greenhouse gases to cast doubt on climate science” and of the mistrust of science; but no direct recognition of the problem of conflicting views of science and how they are used in public debate.

A third example is a recent *New York Times* article, based on access to academic emails, that discusses how different scientific views are used, and enlisted to act, in the GMO food debate (Lipton 2015): “The emails provide a rare view into the strategy and tactics of a lobbying campaign that has transformed ivory tower elites into powerful players. The use by both sides of third-party scientists, and their supposedly unbiased research, helps explain why the American public is often confused as it processes the conflicting information.”

The point of bringing these examples here is to show that even if the use of science in public debate is a burning issue, there is often no realisation that there is a growing number of different scientific perspectives available, which differ in their approaches and in the knowledge they produce, or reflections on the implications of this for the use of science. And even when the role of different scientific views is recognised, the emphasis is often on the role of corruption in some form, with the underlying understanding that if there was no misconduct we would have no problem. The outright enlisting of academics in the lobbying and public relations strategies of food industry companies for “the gloss of impartiality and weight of authority that come with a professor’s pedigree” (Lipton 2015) is not in focus here. We are interested in the more general and subtle use of different scientific perspectives in public debate to serve particular purposes.

The aim of this paper is to explore how different scientific perspectives are used in democratic debates, looking for evidence of the tactical use of scientific perspectives, and to explore the underlying mechanisms...
of the tactical games of debate. We present and analyse a few cases and discuss how these can be understood from the perspective of social systems theory and a perspectivist understanding of science.

ANALYSIS OF CASES

In this paper we analyse two cases: a feature article in the Danish weekly newspaper *Weekendavisen* on the harmful nature of organic agriculture, which clearly shows the characteristics of a tactical debate game, and the fact-finding programme *Detektor* in Danish television, which shows the self-defeating nature of the pursuit of reason.

FEATURE ARTICLE ON THE HARMFUL NATURE OF ORGANIC AGRICULTURE

In the following we present a selection of quotes from the feature article “Naïve, selfish and harmful” by Poul Vejby-Sørensen (2015) to illustrate different tactics in the game.

*WE ARE RATIONAL, YOU ARE IDEOLOGICAL OR THE HIDDEN INTEREST*

“If all agricultural land in the world was farmed organically there would only be food for four billion people. Today we are over seven billion and in 2050 we will be over nine billion. … Those who want to enforce the conversion of agricultural production to 100% organic must consider what part of the earth’s population they imagine should be sacrificed on the altar of ideology.” This is the “feed the world” argument against organic agriculture. Similar arguments can be found internationally, e.g. on the home page Roots for Growth which is led by a network of the world’s leading fertilizer industry associations (http://rootsforgrowth.com/sustainableagriculture), except that the number that organic agriculture can feed here is 2.4 billion people.

The feature states that Vejby-Sørensen has a master in agronomy and is professional consultant in the Danish association Sustainable Agriculture (Bæredygtigt Landbrug). This association is actually a protest movement against regulation and restriction of agriculture, that seeks e.g. to remove the environmental restrictions on farming to make the industry more competitive in EU. But this ideological basis is not described in the feature. Instead the feature is constructed as a struggle of rationality against ideology. In effect the vested interests of the organisation are hidden. The hidden interest tactic enables the author to present himself as the advocate of reason against the irrational and ideological opponent.

*ANALOGY TO FAILED SCIENCE*

“Some will double the organic production by 2020. Some want 100% organics by 2050. It can’t become any worse. They don’t know what they are talking about. Thoughts are led to history, where the Soviet Union was mistreated by a political regime under Stalin, which in the same way flirted with the idea that fertilisers are not necessary. These completely unrealistic ideas led agriculture astray and became a disaster for the Soviet Union. Enforced conversion to organics will be an equally big disaster for Denmark.”

The feature article goes on at length on the disaster of Stalin’s promotion of Lysenko to president for the academy of agriculture and the elevation of his ideas to state ideology because they fitted into Stalin’s plans for the collectivisation of agriculture. The article states that the forced conversion to organic agriculture will be an equally big disaster for Denmark, taking the analogy to be valid without arguing this in any detail. This draws the analogy to failed science tactic, which again is a variant of the well-known strawman tactic. The analogy here is false in many respects, including that the government of Denmark has no plans for enforced conversion, and that both organic and conventional farming receives financial support, mostly through the European Union.
THE NOBEL PRIZE ARGUMENT OR THE BETTER SCIENCE
“...The so-called Haber-Bosch method [for the production of nitrogen fertiliser], invented by Fritz Haber and further developed by Carl Bosch, earned them both a Nobel Prize in chemistry in 1918 and 1931 respectively. Their invention was of enormous importance and has saved billions of people from starving to death. Among a circle of Nobel Prize winners exactly the awards for Haber and Bosch were selected as the most important for humanity ever.” Similarly the article describes how the Green revolution has saved billions of people from starving to death and earned Norman Borlaug a Nobel Peace Prize.

Referring to Nobel Prize winners, however faintly they are related to the actual argumentation, is a variant of the better science tactic. In this article there is in fact no mention at all of the substantial amount of science behind organic agriculture; it is presented as a romantic ideology and the only science referred to is the failed science of Lysenko.

MARKET IS RATIONAL AND POLICY IS RELIGION OR THE ECONOMY, STUPID OR THE HEGEMONIC PERSPECTIVE
“Then what is the conclusion? Let the organic production develop on market terms, so that it achieves the size consumers want in their prioritisation. It is completely unacceptable that the state, without documentation, uses public means to promote a politically selected form of production that leads to far larger problems that ordinary modern production in terms of yield, environment, nature conservation and economy – and which has no health benefits either. In a proper democracy spending billions must be substantiated with more than just some vague political-religious ideas. But when the election campaign starts, naïve politicians become the nature’s worst enemies.”

Using arguments from a hegemonic perspective is an efficient means of argumentation when there is a conflict between scientific perspectives, and economics is the perspective of choice in modern society. The “the economy, stupid” tactic is thus used here as in most other democratic debates. In other examples the flexibility of economic assumptions and results are helpful in this regard. Interestingly the tactic here is to pose market and economy as the instruments of reason versus politics as quasi-religious, despite the favoured role that economics generally has in politics (with “the politics of necessity” as an extreme where this political strategy seems to eliminate the very function of policy).

As an aside the “without documentation” is evidently wrong in Denmark where there is a tradition for making large action plans and knowledge syntheses, heavily based on science, as the basis for policy and research programmes on organic agriculture (e.g. Action plan for organic agriculture 1995, Action plan II 1999, and two major knowledge syntheses on continued development and market-based growth, Alrøe and Halberg 2008, Jespersen 2015).

CONSTRUCTING A DIFFERENT PERSPECTIVE OR STEALING THE AGENDA
“Organic agriculture is not only a romantic niche. It is also naïve and selfish. Naïve because the concept is not sustainable. Selfish because the concept will lead to devastating consequences for nature and climate. ... It is climate-hostile because of increased emission of greenhouse gases, it is environmentally damaging because of larger emissions of nutrients, and it is nature-hostile because of lesser yields and therefore larger demands for land. ... Luxury use of land will obviously be detrimental to the world’s natural resources. On this basis, organic agriculture is one of the worst enemies of the rainforest.”

Based on the above tactics, which legitimise one’s own perspective and delegitimises the opponent’s, the field is open for constructing a different perspective that offers the opposite conclusions of mainstream science. To our knowledge, based on long term experience with research in sustainable agriculture and
organic agriculture, there is no existing scientific perspective that characterises organic agriculture in this way. There are different arguments from different perspectives on some of the statements, and contested data on some of the other, but no such coherent characteristic of organic agriculture. The feature article constructs this different and seemingly rational and science-based perspective. This is similar to tactics employed to denigrate and delegitimise climate science and promote arguments from a small number of contrarian scientists and sceptical bloggers as a coherent climate change sceptical perspective (e.g. Elsasser and Dunlap 2013, Jaspal et al. 2012).

A few examples of the complexity of the issue, which are not touched upon in the article, are the amount of food crops used for bioenergy and livestock production, the importance of food regime and changing diets (e.g. growing meat consumption), food loss and food waste, that smallholder farming with little or no use of artificial fertiliser and pesticides is currently the backbone of food security in the developing world, not to mention the often overlooked environmental costs of conventional production, such as the threat to rainforests from the massive import of soya from tropic countries, the disruption of ecosystem services (e.g. decrease of pollinators), etc. etc. (e.g. Horlings and Marsden 2011, Tscharntke et al. 2012).

The construction of a different scientific perspective by selective and tactical use of scientific results, or claimed scientific results, is a main tactic (or perhaps strategy is a better term here) of the association behind the feature article (based on our knowledge of other writings, lawsuits, etc.). This enables it to take over the positive agenda of sustainable agriculture and use it to promote non-sustainable agriculture. The name of the association, Sustainable Agriculture, is a first step; the use of arguments that pose ordinary agriculture as already sustainable is a second step; and the denigration of the original proponents of sustainable agriculture, like in this article, by means of its showing how they fail on their very own main themes and goals, is a third step. This steal the agenda strategy is especially efficient because it operates by way of utilising conflicting scientific perspectives in a tactical game of debate.

### Summing up on the Feature Article Analysis

This brief analysis shows an example of how conflicting perspectives are used in the debate on sustainable agriculture in Denmark. We have identified different tactics used and shown how they relate to the use of the idea of rationality, the authority of science and different scientific perspectives.

The analysis also shows the lack of demands for overall argumentative coherency in the debate. That is, there is no demand for arguing from one and the same perspective; perspectives can be continuously shifted based on what gives an argumentative advance in the conflict, and the contradictory use of different perspectives is not ruled out.

A particularly salient characteristic is the double bind use of science in the debate: arguments are utilizing science as an authority and at the same time used to undermine the authority of science, and it is not possible to leave the arena of so-called rational debate.

Some other mechanisms in the game of conflicting perspectives are the use of obvious truths, truths that are seen, or presented, as so self-evident that there is no need to argue for them, unquestioned taboos, things that are left out without arguing for why they are left out, and tautological conclusions, conclusions that follow from hidden assumptions.

### Fact-Finding as a Possible Remedy – DETEKTOR in the Election Campaign

One could think that what is needed in democratic debates is impartial parties, such as journalists, that go in and check the facts to show what is true and what is not. We investigate this possible solution by analysing...
an example from the television programme *Detektor*, a fact-finding programme that checks the use of numbers and statistics in public debates. *Detektor* put many resources into checking the numbers used in political debates in the recent election campaign in Denmark; particularly the political debates between the leaders of the government and the opposition. Despite the efforts, the programme often had to admit that there were several approaches to calculate the numbers and that it was not possible to say that one was right and the other wrong. For instance, on June 8th 2015, two different numbers had been given on the number of people on transfer payment; Helle Thorning Schmidt said it was about 720,000 people, and Lars Løkke Rasmussen said it was about 800,000. Another example, from June 9th, concerned the number of people on transfer payment that would not have a noticeable benefit from getting a job; Lars Løkke Rasmussen argued that the correct number was 330,000 and Helle Thorning Schmidt argued that it was 240,000.

*Detektor* is an interesting case because the programme is based on the idea that there is a common rational foundation upon which it can be decided which facts are right at which are wrong. But despite this basis it repeatedly comes up short, without being able to make this decision. The analyses and calculations made by *Detektor* lead to contradictory facts, because facts depend on the assumptions made, the approaches and methods used, etc. These assumptions and approaches are not innocent, they are value-laden, and different political parties, as well as different scientific perspectives, would prefer different assumptions and approaches. In effect, the programme ends up illustrating the failure of its very basis, the idea of a common rationality that can support rational decisions. And politicians still get away with using different numbers in the tactical game of political debate, despite the intense surveillance of critical media.

**DISCUSSION – THE MAIN POINTS**

Why is this? Why this seeming impotence of the otherwise robust rules of engagement in democratic debates toward the tactical use of different perspectives? One might think the answer lies in the lack of an overall rationality in society, in which the different perspectives can be compared. We don’t think there is any hope of establishing such a common rationality. But it is the idea of an overall rationality, or a common rational space, that makes the game of conflicting perspectives possible.

The basis for this understanding lies in Niklas Luhmann’s social systems theory, which describes how society differentiates into different semantics, and subsequently different function systems, which operate on different distinctions and different logics (e.g. Luhmann 1995, Noe and Alrøe 2015). These different function systems are linked with main organisation systems in society, the function system of economy with national banks and other financial organisations, the function system of law with the court system, the function system of health with the hospitals and other parts of the medical organisation system, the function system of war with the military forces, the function system of science with the universities and research institutes, etc.

Each function system harbours a different perspective on the world, with different values, logics, distinctions and instruments of observation. And each function system develops its perspective in some interplay with the system of science, because science is the function system that specialises in handling observation and learning in society. Not all in the same way, though; the function system of religion thus operates to a large degree independently of, or even in opposition to, the system of science. But the main point here is that in the same way that the overall perspectives of society, economy, law, health, religion, war, etc., are used in the

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2 https://www.dr.dk/tv/se/detektor-tv/detektor-valg-2015-5#!/06:12
democratic debates, so are the scientific perspectives. And the scientific perspectives have differentiated historically into many different perspectives and keep differentiating. Different perspectives that can sometimes be used interchangeably, and which are often incommensurable, because they rely on different values, assumptions and logics, and sometimes even complementary, in Niels Bohr’s sense, because one perspective interacts with the world it observes in a way that precludes the use of another perspective (Alrøe and Noe 2011, 2014).

Below we discuss the main points of the analysis in terms of social systems theory and a perspectivist view of science.

**POINT 1: RATIONAL ARGUMENTATION IS BOUND TO PERSPECTIVES**

We must give up the idea, or ideology, of a common rational space in which democratic debates can take place. The rational space cannot incorporate multiple contradictory perspectives. Rationality exists only within systems’ logics (in a first order perspective).

The point that we would like to stress here is that the use of incommensurable and complementary perspectives in public debates precludes, at least in a first order perspective, the unitary rationality that is needed to settle a debate by means of arguments. There is no common place from where the arguments can be held accountable, no common rationality across all perspectives. Ones man’s folly is another man’s reason.

The critical media are able to check the facts behind a given number, but they are not able to determine whether it is more correct to use one number, coming from one perspective with its incorporated values, assumptions and logics, or another number, coming from a different perspective with different incorporated values, assumptions and logics. Therefore the debate often transforms from a rational debate where arguments are tried out against each other, where the arguments inflict on each other, to a rhetorical conflict where numbers and cases are used in a tactical game to outmanoeuvre the opponent: the arguments do not inflict on each other because they come from different perspectives, and the numbers are, at least for all practical purposes in the conflict, incommensurable and it cannot be said that one is more right, or wrong, than the other.

**POINT 2: THIS IS NOT A MATTER OF CONFLICTING INTERESTS**

The traditions of public democratic debate can handle the matter of conflicting interests; for instance in form of rules such as “all sides must be heard” and “opposing sides should get equal opportunity and time to express their views”. But in the game of conflicting perspectives, the differences in interests and values are hidden behind the rationale of rational arguments.

We do not propose that the game of conflicting perspectives is the only game in democratic debate. But we believe this is a different game than the well-known struggle between interests in society, and that it is a distinctive and important phenomenon.

Furthermore, mistaking the conflict of perspectives for a conflict of interests can serve the purpose of the tactical game. For instance, the feature article may have been accepted in a major Danish newspaper based on exactly the argument that all sides must be heard, though it is clearly involved in a very different game.
POINT 3: THE TACTICAL GAME
The game of conflicting perspectives is constructed as a discussion of facts and not values. Facts are posed as decisive against values. The game is a game of reason, and values are not admitted as a valid ground of argumentation.

The game entertains a tactical use of different perspectives to substantiate the arguments. The use of perspectives is selective and tactical. That is, the argumentation is not based on an actual scientific or political perspective, but sometimes a perspective is constructed to form a seemingly coherent ground of argumentation.

In fact, facts belong to perspectives. The idea of a common rational space conflicts with the understanding that there is a multiplicity of observing systems, and that the different functional, scientific, organisational, etc. perspectives differ in terms of their conditions and means of observation. To ignore that facts belong to perspectives is to ignore differences in assumptions, values, approaches, etc. in different perspectives in the game.

POINT 4: THE DOUBLE BIND OF THE TACTICAL GAME
If you enter the discussion, you accept the premises of the game. If you don’t, you accept the arguments of the discussion.

The premise of the game is that there can be a rational argumentation without revealing values and assumptions. Disagreement is taken as a matter of the rational | irrational distinction.

So, if you enter the game with rational arguments, you lose, because this means you accept the premises of the game. If you enter the game with value arguments, you lose, because the game says this is a rational discussion, and by meeting the arguments of reason with attitudes and values, you have excluded yourself from the rational space.

CONCLUSIONS
The paradox we described in the beginning of this paper is that the differentiation of more specialised perspectives on sustainability does not lead to more sustainable development. On the contrary, this leads to increase in complexity and increased possibilities for tactical games of debate.

This is a challenge to the public democratic debate. The challenge must be met by handling the game of conflicting perspectives according to what it is and not mistaking it for a game of conflicting interests.

This challenge requires new social-systems-based rules of democratic debate. A first step is to ensure attention to the role of conflicting perspectives in public debate. This can reveal the tactical game for what it is and help clarify the debate. Some means to do this are:

- Describe the perspectives that are used in the debate
- Reveal the interests
- Attach facts to perspectives
- Insist on the necessity of the discussion of values
- Attention to mechanisms of protection of perspectival blindness

This attention to perspectives can only be done by way of second order observations.
Attention to the tactical game of conflicting perspectives is important to both the general public and science. There is an increasing disgust with politicians, and the game of conflicting perspectives does no good in this respect. Science has an obligation to serve public interest and society, and the purpose and image of science suffers from the game of conflicting perspectives.

The main paradox of democratic debate in society today is that it is the very idea of a common rational space which prevents us from having a “rational” critical public debate. It is this very idea that makes the tactical game of conflicting perspectives possible.

REFERENCES


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