Expertise that matters.
On Dewey's understanding of relevant science

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Abstract: Expertise is much contested in modern democracies. In this article I shall investigate whether Dewey's understanding of science and expertise provides us with some answers about the interplay between science, the public and society. Decisive for Dewey's vision of the relation of democracy and science is that epistemic qualities and what he calls "organized intelligence" should contribute to find the best solutions for human wellbeing and growth. Science and expertise that can live up to this purpose are relevant from a pragmatic viewpoint. I shall suggest a reading of Peirce's pragmatic maxim as a test for relevance that can be used to conceptualize a pragmatic version of science and expertise in the public interest.

Keywords: Dewey; expertise; science; democracy; public sphere; C.S. Peirce; pragmatic maxim; fundamental and application-oriented research

> Mir ist es wichtig, dass möglichst viele Perspektiven aus der Wissenschaft in die Diskussion einfliessen. Nur so lässt sich der Eindruck eines wissenschaftlichen Sachzwangs vermeiden. Wir sollten mit der Fiktion einer einzigen wissenschaftlichen Wahrheit aufräumen. Die Corona-Krise bietet dafür eine Chance. Wir müssen sie packen, wollen wir vermeiden, dass Experten irgendwann als Schuldige dastehen. Zu dieser Aufgabe können die Geisteswissenschaften einen Beitrag leisten.
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> Caspar Hirschi in *Neue Zürcher Zeitung*, 02.05.2020

Concerning the role of experts in the Corona-crisis of 2020, the Swiss Professor of History Caspar Hirschi brings forward a particularly interesting and sharp remark. He highlights that the recognition of plurality is essential to scientific expertise, not only because the empirical sciences do not just pro-

ISSN (print) 2281-8618-ETS DOI: 10.4454/philinq.v8i2.306

duce 'one truth', but also because science[1] otherwise could become a public scapegoat if political decisions that are justified by scientific results turn out to be wrong. Although science advices politics with expertise and has effects on politics and policies, even more in a situation like the Covid 19 pandemic, Hirschi does not want to put the weight of responsibility for genuinely political decisions on the shoulders of science. The background premise of Hirschi is obviously that science, the public, and politics are in a more complex relationship than the idea of science as the value neutral source of expertise indicates. Hirschi also expresses the hope that the humanities could contribute to enlightening the role of experts and expertise in society. This is a hope that fits well with the visions of many philosophers. John Dewey and Jürgen Habermas, among others, both think that the interplay between science, the social sciences, and the humanities with the public are vital for both research and an open and critical public sphere, as well for an informed democracy in general. This positive role of science, the social sciences, and the humanities is not necessarily in contradiction to a critical evaluation of an elitist democracy that is governed by experts. Habermas argues that the rule of experts would undermine democratic legitimacy (Habermas 1987, Turner 2001). It is certain that the current Corona virus crisis minds us about what seems to be the promise of science, namely, to deliver control and foresight, but also to warn about the dangers of technocracy or epistocracy, as well as the necessary uncertainty that is part of a scientific and technological civilization.

In this paper I shall confine myself to investigating how the pragmatist philosopher John Dewey conceptualises how the role of science, the social sciences, and the humanities play their part in modern democracies and how expertise is situated within this interplay. Decisive for Dewey's vision of the relation of democracy and science, social sciences, and the humanities is that epistemic qualities (Anderson 2006) and what he calls "organized intelligence" (Dewey 1935: 56) should contribute to find the best solutions for human wellbeing and growth. However, current conditions of academic knowledge production as well as a general mistrust in the effect of information and knowledge on politicians and citizens equally are developments that contribute to scepticism about Dewey's ideals about the interplay between science, the public, and society. I have two aims in this article. Firstly, I want to show that Dewey's conceptualisation of science actually is able to meet the challenges that are the result of a transformed research landscape. Secondly, for Dewey's understanding of sci-

[1] I acknowledge the difference of disciplines when I use the phrasing "science, social sciences and humanities". In this phrasing, science in singular refers to natural sciences. Otherwise, I use the terms science and sciences generic and synonymous with "all different sorts of sciences, including also the social sciences and humanities".

ence and its contribution to democracy, the notion of relevance is paramount. I claim that relevant research is a necessary condition for good expertise. These two aims are intimately connected and I shall pursue them with the following steps. I shall first unfold two issues of the current context of expertise in society: the idea of democracy as epistocracy or technocracy (e.g. Brannan and Runciman) and the principles that are at stake since knowledge production and the sciences are more and more under the pressure of practice. In the second part, Dewey's idea of what constitutes expertise in relation to democracy and the public is investigated. For Dewey, science, the social sciences, and the humanities could and should orientate towards societal problems. This leads to the question: how can science, the social sciences, and humanities be problem-oriented without being instrumentalised by partial economic and political interests? From a pragmatic point of view the answer is that it all depends upon science and research that is relevant. Pragmatism holds a specific understanding of relevance that differs from mainstream philosophy of science and research logic. In part three I shall explore the pragmatic understanding of relevance and draw upon Peirce's pragmatic maxim to elucidate the pragmatic concept of relevance. The result will be that relevant research is research in the public interest, an interest that Dewey thinks is inherently part of the research process and not the result of partial interference from outside.

Before starting this investigation, a clarification of the terms expertise and expert will be useful. A preliminary and heuristic definition that fits our purpose to explore Dewey's understanding of relevant research and expertise for society will have to do in this context. The terms expertise and expert are part of a broad semantic field that spreads from social epistemology to philosophy of science, philosophy of technology, sociology, and political science. If an expert is someone who has great skills or knowledge in a particular field, and if this is the reason why the expert is able to provide this knowledge on a particular matter for others, two questions arise: the epistemological question of how great skills or knowledge are defined and the question whether the expert is trusted because of her knowledge or whether there are other reasons, such as status or reputation.

First the epistemological question: one version of understanding expertise is veritistic, meaning that an expert is defined by having true knowledge; it is truth that confers authority to the expert (Goldman 2001). However, experts make mistakes; knowledge is for many reasons fallible. It has to be highlighted that fallibilism is not a striking argument against truth orientation. It is rather a warning about the principal limitations of knowledge. But still, the question remains whether or not we can be certain about the truth of expert knowledge, and this uncertainty opens the door to scepticism about science as such. The

veritistic approach has been criticised for not being able to cash out the criteria for when expertise is true (Watson 2018).

The question about there being reasons other than knowledge and skills for being an expert leads to a more sociological understanding of expertise and the expert. Then, "being an expert is a reputational phenomenon" (Goldman 2018: 3) and practical skills like being able to explain complex facts to the public are equally relevant than having knowledge (Collins and Evans 2007). This opens up a difference between expertise and science: being a scientist (having knowledge and skills) is not sufficient for being an expert (cf. Barrotta and Gronda 2019: 24). Experts need to be trusted and credited for their knowledge. However, expertise would become a "vague and fluid" term if it is only up to the public to designate experts and define what expertise is (Goldman 2018: 6). Interests, power, ignorance, all sorts of other conditions can play a role when expertise is defined from outside the sciences and academia.[2] Although this is a principled problem that cannot be avoided in the encounter of academia with politics and the public, the conclusion that it is only up to the public or politicians to decide what counts as expertise is also wrong for a very simple and more practical reason: expertise builds on credibility. Expertise that turns out to be wrong discredits the institution and the experts behind the expertise in the long run. I shall not pursue the problem of trust and credibility directly in this article. Indirectly however, the credibility of research is a subject of the projected conceptualisation of a pragmatic understanding of expertise. More precisely, what is to be shown is that from a pragmatic point of view credibility would be based on the commitment of a research institution to the rules of science, to epistemic qualities, and its role within a citizenry.

What we need for the purpose of this article is a view on experts and expertise that articulates the scientific criteria to distinguish knowledge from opinion, that takes the practices of science, the social sciences, and the humanities seriously, but that also is sensitive to the role of expertise in society. Watson is concerned with the two first elements: "the strongest instances of expertise require a community of epistemic authorities to help confirm, disconfirm, and refine claims made by the putative expert" (Watson 2018: 41). Without a self-correcting scientific community that applies principles for valid and sound research, such as methodological rules, expertise cannot gain legitimate authority. The expert's understanding of "a substantial proportion of the terms, propositions, and arguments" of a particular subject matter or field is thus

[2] One has to add that these conditions also play a role inside of academia, although here are also different measures (scientific methodology or peer review for example) available that take counter measures of the effects of these conditions.

'tested' by procedures of justification within the scientific community (Watson, 2018: 46). Barrotta and Gronda have convincingly argued for the third element to include into definition of expertise. They highlight how expertise is dependent upon the public and call this the "relational nature of expertise" (Barrotta and Gronda 2019: 22). Expertise also needs to be accepted for its authority by the public – an acceptance that does rely also on other factors than inner scientific standards. Only if expertise is trusted can it fulfil its function. I will come back to this topic with Dewey's understanding of the relation between the public and science.

This leads us to a minimal conception of expertise that, as we will see later, provides a good starting point for the pragmatic understanding of expertise. Expertise then comprises of knowledge and skills that have been achieved according to the rules of science (including those of the social sciences and humanities) as well as been questioned and tested (according to the rules of science, social sciences, and humanities) within the scientific community and within a public with the assumption of a general orientation towards truth-seeking. Here, truth-seeking is understood in a broad way without commitment to a specific theory of truth. As Cheryl Misak puts it, truth-seeking is the attempt to "getting things right" (Misak 2011: 472); an orientation committed to epistemic qualities and to settling disagreement by investigation, testing, and deliberation. This kind of 'getting things right' also includes different types of knowledge, such as local knowledge, as so far as it can be dealt within and inform the more strict framework of science.

1. *Setting the stage: Science under pressure and the prospect of epistocracy*

Unsurprisingly, experts and expertise are important for modern societies, as modern societies are knowledge-based societies (Stehr 1994). That expertise exhibits significant power in modern societies and influences politics and policies is not always seen as a valuable partnership. Expertise has been contested by the public. This is the topic that Tom Nichols presents in his book *The Death of Expertise* (2017). He diagnoses a broad ignorance in the US public allied with a distinct disgust for experts and elites. There is no longer a respectful exchange between the public, politicians and the experts, and Nichols is therefore concerned that the distrust in expertise puts democracy in a dangerous situation. Another characteristic of what has been coined knowledge society can be found in the fact that the lines between science and society are getting blurred and a new realm occurs, which the sociologist Gil Eyal calls "trans-science" (Eyal 2019: 142ff.). This is a realm where facts are mixed with

values and the public debate takes place with very different stakeholders, interests, and criteria. Another development that changes the role of expertise in society has been called into attention by John Ziman (Ziman 2002). According to Ziman, research institutions and universities have undergone dramatic transformations in the last 50 years, resulting in a "post-academic research culture dominated by instrumental values" (Ziman 2002: 399). If this is correct, expertise might not be able to represent the necessary knowledge to inform the public anymore. Expertise and how science is related to politics, the public, and society is indeed a complex affair.

Looking at the crucial function that science and research occupies in modern knowledge-based and technological societies, these changes in research culture that I have mentioned briefly are of great importance. On the one hand, science, the social sciences and the humanities are expected to deliver expert knowledge for all realms of society. To fulfil this task, one would think expertise has to be neutral to partial interests. Robert Merton's CUDOS norms capture this classic understanding of science.[3] On the other hand, universities and public research institutions in most countries have changed tremendously. They are more and more orientated towards the labour market and economic success. The autonomy of research institutions and universities has come under pressure. Commercialisation of research and education is not the exception anymore but is built into the new management structure of universities. This transformation has also been delineated as the development of research from knowledge modus 1, which stands for the classical fundamental research model, towards modus 2, which is based on applied research and knowledge oriented towards public and social impact (Nowotny, Scott and Gibbons 2001). Can this new type of universities and research institutions provide the sort of expertise that is necessary for societies? I cannot address this question directly in this article. However, the pragmatic concept of the relation between science, the public, and democracy should be able to give some hints in this direction.

Before looking into the issue of a possible loss of epistemic qualities of expertise because of application-oriented research and science, I shall first turn our attention to the opposite position, namely that expertise is valued very highly and should not be reduced to an advisory function. This is a position held by Jason Brennan (2016) and Garett Jones (2020) for instance, a position that has a predecessor in Walter Lippmann's critique of the public sphere in 1922 (to which Dewey answered with his book on *The Public and its Problems*).

[3] CUDOS stands for: communality (common ownership of intellectual property), universality (scientific validity independent from context), disinterestedness (science for the purpose of science and not for other interests) and organized skepticism (institutionalized procedures and methodologies for critical scrutiny of scientific claims), see Merton 1973.

As Lippmann does, Brennan and Jones claim that not only does democracy need experts but also that they should have a greater say in politics than the common citizen. Brennan's and Jones' critique of contemporary democracies leads to a new role for expertise. According to their diagnoses, common citizens are not what they are ideally supposed to be, namely informed and interested in open deliberation, which includes the possibility to be convinced and to convince others as well as accepting dissent even about issues that involve deep beliefs. In Brennan's words, citizens are Hobbits (not interested in issues of public relevance) or Hooligans (non-pluralistic minded even when liberals), and only very few are Vulcanians (rational and analytic). Vulcanians are able to evaluate issues rationally, able to deliberate, and are susceptible to reason. Already John Stuart Mill has thought that a weighted vote could be a solution for what he saw as the unhealthy dominance of the uneducated and disinterested (Mill 2010). For Mill, the right to vote included a learning process of citizens, so that in the end they could become more Vulcanian. Both Brennan and Jones do not think that this is realistic. On the contrary, Brennan argues that voting does not make us better citizens in terms of being able to see things from the perspectives of others; rather, elections make us more stupid and polarize political and other value positions even more (2016: 7). Another effect of elections is, as Jones points out, a certain short-termism (Jones 2020). Politicians only feel responsible for results visible within the period elected and not for long-term results of their politics. Experts seem from Brennan's and Jones' viewpoint superior to such mundane classical biases as gender, race, age, or personal interests. Brennan favours an epistocracy, where those who have better and more intellectual qualities have more right to say. Basically, Brennan and Jones argue that political decisions should be at least partially replaced by expert decisions, a replacement that already Lippmann has suggested with his intelligence bureaus (Lippmann 1922).

David Runciman in his somewhat pessimistic book *How Democracy Ends* (2018) also diagnoses that experts as well as technocrats are an important part of democracies. However, he is critical about Brennan's suggestion of an epistocracy. In the first place, Runciman argues that experts have already taken over in the form of the administrative machinery that reduces the choices politicians and citizens can make. The administrative system exhibits power that cannot be questioned anymore. Runciman obviously thinks more in the line of the sociologist Max Weber, who saw the dominance of bureaucracy and administration as the biggest and most devastating threat to democracy (Weber 1972: 570). Secondly, Runciman refers to social science studies that show that "cognitive biases are no respecters of academic qualifications" (Runciman 2018: 184). Experts are not necessarily fitter at withstanding e.g. confirmation

bias and are thus no better at making good or moral decisions than the layman. The collaboration of German scientists and scholars with the Nazi-regime from the very beginning is a case in point (Kuhn 1966). Whether expert decisions should replace political decisions cannot be justified with their cognitive or moral superiority. Runciman also points to the technocracy that is luring behind an epistocratic model of democracy. It is the IT architecture, algorithms, reputation systems, and the likes that select which information the citizens have access to.[4] From this perspective, the solution is not to give more power to experts but to make experts' power more transparent.

The next background issue for the conceptualisation of a pragmatic understanding of expertise is the transformation that universities and other public research institutions have undergone in the last 50 years. "If science is left at the mercy of politicians and corporate leaders," the philosopher of science Martin Carrier states, "its commitment to truth is feared to be traded for its capacity of intervention" (Carrier 2011: 12). What he expresses here is a concern about a possible lack of epistemic qualities, of objectivity, and of scientific rigour if research is directly oriented towards utility and purposes which are external to the sciences. To pursue this concern, Carrier distinguishes two types of science orientation, not unlike modus 1 and modus 2 of (Nowotny, Scott and Gibbons 2001), and investigates the differences between these two approaches regarding for instance epistemic qualities, problem selection, research freedom, and accountability. The first type of research is epistemic or fundamental research. Fundamental research is knowledge-driven in its problem selection; science is guided by the metaphor of deciphering the book of nature. The other type of research is application-driven research which has the purpose to be useful and oriented directly towards the implementation of the research outcome. Application-driven science is not guided by understanding but by intervention. Science and research, according to the fundamental model, only follow their own interests, which is the epistemic interest for knowledge. Selection of the research problem, choice of methods, theories, and technology are subordinated to the field of knowledge – be it called episteme (Foucault), paradigm (Kuhn) or research program (Lakatos). A good example for the ethos of fundamental research is the rejection of "Cesar Milstein and Georg Kohler, after

[4] To investigate in depth the role of the internet for expertise is not in the scope of this article. Whether the IT architectures or the sheer abundance of data and information on the Internet, or, a combination of both, contribute to the venomous non-culture of discussion that could be found on the Internet and other media today, is a difficult question. However, it is clear that the internet changed, at least in the public eye, what counts as expertise and how to get access to expertise – not to talk about the well-known however mislead belief that a Google search instantly turns us into an expert of the search issue (Nichols 2017: 105ff.).

the discovery of monoclonal antibody-producing hybridoma cells" to obtain a patent for their research, "arguing that it was inappropriate to control exclusive rights to a potentially life-saving discovery" (Bok 2003: 140). While commercial interests as an external influence are not well respected in fundamental research, another factor, that traditionally also has been seen as external to science, is now an integrated part of research. Research ethics have become an integrated part of fundamental research as well as application-driven-research.[5] Research ethics regulates science and research and it is legitimate to ask for accountability of research. Although an integrated part, the relationship between research and ethics is not always a harmonious one. In contrast to fundamental research, patents are important in application-oriented research. The economic interest is often directly coupled with the interest in knowledge. Ziman claims that application-oriented research – or, as he calls it, "instrumental science" (Ziman 2002: 397) – is "proprietary rather than public", and in general prone to corruption and conflict of interests (Ziman 2002: 399). In extremis this would mean that expertise, that is the result of application-oriented research, delivers the result the customer, be it politics, the economy, or the public, has ordered.

However, things are not as clear-cut as they seem. Carrier outlines in a convincing way that contrary to the understanding of pure science and fundamental research, "the promise of utility was part of the scientific enterprise right from the beginning, and it is this entanglement of knowledge and practice which underlies application-driven research" (Carrier 2011: 17). Perhaps not surprisingly, fundamental and application-driven research differ little when it comes to epistemic qualities such as accuracy or consistency (Kuhn 1977). However, application-driven research is limited to defined purposes and therefore might not develop theories that can be applied to a broad scope of subjects (Kuhn 1977). Other epistemic qualities that Kuhn names are creativity and innovativeness. Application-driven research allegedly lacks these qualities because it focuses solely on functionality for a defined purpose. Albeit these qualities are often treated as if a theoretical analysis can decide whether fundamental or application-driven research is more or less innovative, actually it is also an empirical question. Carrier concludes that there are examples and counterexamples for creativity and innovativeness for both types of research. He can be backed up by studies in the field of practice-oriented philosophy of science (e.g. in the work of Joseph Rouse) and in Social Science and Technology Studies (SSTS). Both have shown that the alleged purity of science exists only as a narrative to a great extent, and that in reality practices, values, and tech-

[5] The role of research ethics in the EU research programmes is a case in point (see: https://ec.europa.eu/research/participants/data/ref/fp7/89888/ethics-for-researchers_en.pdf).

nologies play a tremendous role on every level of the research process. While application-driven research and science "does not suffer, in general, from a loss of depth, credibility or creativity" (Carrier 2011: 27), one could however assume some probability that application-driven research and science is more vulnerable to biases. The question is whether this is genuinely a problem of the practical purpose or rather of the commercial funding of application-driven research. A different type of research, one that commits itself to usefulness and problem orientation without allying with commercialisation, could be an alternative.

In a remark, Carrier refers to Sheldon Krimsky's book *Science in the Private Interest* (2003) in which the author criticises the commercialised universities, saying that they do not work anymore for the "betterment of society" (3) but being dominated by partial, mostly economic interests. A possible third type of science and research, not in private but in public interest, would be an alternative from Carrier's perspective.[6] What would be decisive for this type of research is to be problem-driven however, neither automatically accepting the definition of a purpose brought forward by companies or politicians, nor falling back into inner-disciplinary problem definitions, thereby being in danger of placing science in an ivory tower. Barrotta and Gronda (2020) also point to a third type of research, one that takes place in a "community of inquirers" (Barrotta and Gronda 2020: 91) and is bridging the gap between laypeople and scientific experts. Also, Barrotta and Gronda point to Dewey as a possible inspiration for such a third type of expertise, which underpins my claim that Dewey had science and research of this kind in mind.

This first part has the function to present two major background problems that need to be addressed in order to evaluate if Dewey's conception of science, the social sciences, and the humanities today still provides us with answers to the question of which role science and research should play in a well-functioning and thriving democracy. The suggestion of Brennan and Jones to put expertise and experts in the centre of power of democracies is a radical response to the crisis of the political culture in Western democracies. However, the crisis is not entirely new. When Dewey wrote in 1927 *The Public and its Problems*, he also talked into a crisis of democracy and drew a different conclusion. From the short investigation into the consequences of the transformed landscape of science and research that I have undertaken in this part, I conclude that application-driven research is not necessarily a problem for the epistemic quality and credibility of research. I argue that we have to look for

[6] Another philosopher to consult on this topic would be Philip Kitcher who has worked on the topic of the relation between science and society, e.g. Kitcher 2011.

an understanding of science and research that is both problem-oriented and in the public interest. This would also give us a better understanding of the function of expertise.

2. *Democracy and science*

In this part I shall focus on the relation between science, society, and democracy in Dewey's philosophy. I shall first give a short description of Dewey's understanding of democracy before discussing the role of science and expertise. Dewey claims that democracy and science have similar structures regarding their form of organisation (cooperation), procedures (experiment), and goals (enrichment of experience, wellbeing). The public sphere takes a special role; it constitutes a link between the specialisation of research and society as a whole.

For Dewey, democracy is a way of life and a form of society, "the idea of community life itself" (Dewey 1991: 148), and not merely an institutional arrangement that builds the framework for popular sovereignty. Democracy is, in the words of Axel Honneth, "a reflexive form of community cooperation" (Honneth 1998: 765). In Dewey's philosophy, democracy is also a method as he outlines for instance in his article on "Liberalism and Social Action" (Dewey 1935). Science and democracy share a fallibilistic and experimental attitude. Both claims together, the reflective way of life-claim and the method-claim, make democracy, in Dewey's understanding, much more than political democracy. Contrary to some philosophers, who interpret Dewey's concept of democracy as ethical (see e.g. Bernstein 2010, Pappas 2008), Frega argues convincingly that democracy grows from social relations and sociality (Frega 2019). Dewey's understanding of democracy is social and neither predominantly political nor what traditionally is called ethical. Cooperation is the form of sociality that Dewey thinks builds the foundation for society. I shall first examine how democracy is a reflexive form of cooperation before exploring democracy as a method and thereby elucidating the intimate connection between science, the public, and democracy.

In *The Public and Its Problems*, Dewey says that democracy "must affect all modes of human association, the family, the school, industry, religion" (Dewey 1991: 143). In this understanding democracy enables human beings to flourish and to develop their capacities on every level of society. This happens through cooperation and interaction, activities that form the principles of Dewey's social ontology. Communities are networks and agglomerations of human beings, and their interactions, which, becoming stable, establish habits and traditions. There is, however, no real stability in communities nor

is there in democracies. Societies are under constant development and have experienced an acceleration of transformation in modernity. This emphasis on transformation and change is also the reason why Dewey's idea of democracy, although he sometimes takes residue in the language of organisms,[7] is not anti-modernistic or nostalgic. Democracy is a reflective way, and Dewey argues that it is the best way, of organising these interactions and transformations. Reflection upon the organisation of cooperation is situated on different levels of society. For example, in the public the reflection is in the open and takes place in forms of debates and discussions. The same goes with a more disciplined agenda, for the parliament and its institution. The result of this view is that democracy is seen as a form of reflexive organisation that performs experiments in trying to find the best organisations for the common good and the individual's wellbeing. The emphatic praise of democracy that dominates Dewey's writings should not hide for the fact that democracy for him is the reflective organisation of power and its institutions as well as lived experience, norms, and values. Self-correction and the use of collective intelligence is central to democracy: "[f]or what is the faith in democracy in the role of consultation, of conference, of persuasion, of discussion, in formation of public opinion, which in the long run is self-corrective, except faith in the capacity of the intelligence of the common man to respond with commonsense to the free play of facts and ideas which are secured by effective guarantees of free inquiry, free assembly and free communication" (Dewey 1939: 227). According to Dewey, public debate and free communication, in form of an academic community, a political body or the broader public, are the link that keeps democracy, its citizens, and science connected. Dewey's theory of democracy aims to improve the practices of the democratic community with the use of a vital public sphere, on the one hand, and scientific methods, on the other. If the public sphere is not in good shape, if it is fragmented or purely driven by partial, e.g. economic, interest, then 'free communication' is endangered and democracy will suffer. The same goes for a public where no appropriate framework is available to form an intermittent public focus on a matter of concern. The public, as Dewey has put it, has "not located and identified itself" (Dewey 1991: 182), it has yet not come into existence in its potentially powerful way. This lack of the public is the subject of Dewey's book *The Public and its Problems* (1927). Publicity, transparency as well as accountability are principles that can be traced down in Dewey's idea of a vital and functioning public (Dewey 1991: 166ff). These are principles that also are constitutive for how science functions.

[7] For example, Dewey 1991: 152.

Democracy is not only a form of government and a form of life but also a method according to Dewey (see also Frega 2019). This brings me to the second topic, i.e., the intertwinement of democracy and science. The statement as such sounds rather surprising; why and how could democracy be a method? Dewey gives a historical and structural argument when he says that democracy is able "of generating science which is the sole dependable authority for the direction of further experience" (Dewey 1939: 229). If democracy is a constant process of transformations and changes, of adjustment to new situations and demands, then science and the method of inquiry guide these changes and processes in a controlled way – in order to lead to 'further experience'. However, Dewey's idea of democracy as method is more radical. It is the idea that "organized cooperative inquiry" (Dewey 1991: 51) and "organized intelligence" (Dewey 1991: 56) are processes that govern both science and democracy. That this is a cooperative endeavour already signals that Dewey is not thinking about the classical model of science that authoritatively informs the public and politics. Organised cooperative inquiry can only be brought to life with an active, involved public that has a right to free speech.

It all depends upon how Dewey conceptualizes inquiry. Inquiry is not just a form of guided procedure to find measures to solve a given problem. Both problem definition and solution are part of broader contexts. Inquiry of this form transgresses boundaries between facts and values. Social reform that is informed by social inquiry is normative, checking consequences and its values at the same time, as Henrik Rydenfelt highlights. He points to the fact that in Dewey's understanding of inquiry "the standards of justification are themselves explicated, questioned, revised and determined" (Rydenfelt 2020: 34).

Among the merits of science is the ability to scrutinize critically its own presuppositions. Another one is its transparency. Only with overt action and with experimentation (mostly in the natural sciences), with hypotheses and testing within a scientific community knowledge can be corroborated. The next merit is one Dewey never refrains to highlight. The scientific method is defined by the use of experience in an experimental way in order "to have a new empirical situation in which objects are differently related to one other, and such that the *consequences* of directed operations form the objects that have the property of being *known*" (Dewey 1929b: 70). In Dewey's conceptualisation of the research process or inquiry, the starting and end point are most important. The researcher starts from an indeterminate situation (unknown, uncertain) in order to end with the resolution of the indeterminate situation, to reach knowledge and thus a determinate situation. Knowledge is operational in the sense that it is able to prescribe actions. Dewey thinks of knowledge as linking theory and practice. There seems to be a plausible connection between

knowledge and possible consequences if we take, as an example, a software programme that has been developed to solve a problem. The consequences of using the software programme are part of the knowledge the programme represents and are predictable (within certain limits). Knowledge in the social sciences and the humanities does not rely upon experimentation nor intervene directly, contrary to engineering and application-oriented science. Therefore, we usually do not include consequences as part of knowledge in the social sciences and humanities.

Dewey does not recommend the "assimilation of the human sciences to physical science" (Dewey 1991: 199), however, he is radical in his demand for the application of a sense for consequences. For the social sciences he names three criteria they should live up to in order to be fit to guide social reform and to deliver the expertise that is relevant for society:

> In fine, problems with which inquiry into social subject-matter is concerned must, if they satisfy the conditions of scientific method, (1) grow out of actual social tensions, needs, 'troubles'; (2) have their subject-matter determined by the conditions that are material means of bringing about a unified situation, and (3) be related to some hypothesis, which is a plan and policy for existential resolution of the conflicting social situation (Dewey 1938: 493).

The first criterion addresses the research situation. It is the researcher's task to not narrow down the subject of research beforehand but to be aware of the richness of the indeterminate situation (cf. Gimmler 2018). The first criterion tells the researcher to think about the context of problem definition, and consequently about the application of the solution. The second criterion refers to the research process proper and to logical reasoning, turning the indeterminate situation into a determinate one, highlighting that without an "idea of an end to be reached, an end-in-view" there would be no guidance how to distinguish relevant from irrelevant data (Dewey 1938: 491). If research had lost its guiding problem definition it would lack the self-correcting ability of science and is plodding along with either idealistic prejudices or blind empirical data collection.

His critical evaluation of the social sciences and the humanities has not lost its sting today. His recommendation for the reconstruction *in* philosophy is indeed radical: "pragmatic philosophy means that philosophy shall develop ideas relevant to the actual crises of life, ideas influential in dealing with them and tested by the assistance they afford" (Dewey 1917: 43). In other words, what is needed are social sciences and humanities that not only think of research, but also operate as interventions. To say it in the terminology of Carrier: the social sciences and the humanities are used to a self-understanding

that is shaped according to the model of fundamental research. Should the social science and humanities become more interventionist and application-oriented, and more engineering-like? I have to admit that this part of Dewey's reconstruction of the social science, the humanities, and philosophy is difficult to conceptualise. Research in the public interest is a third type trying to avoid the alternative between fundamental and application-oriented research. Could the social sciences and humanities use intervention in the way Dewey had in mind with an emphasis on transparency and public debate, thereby avoiding that research becomes private property or the subject of partial interests? There are numerous questions and problems related to this understanding of science in public interest – not least a change in research politics and funding. These are questions that lie outside of the scope of this article, however, a contemporary pragmatic vision for the role of science and expertise could include an emphasis on trans- or interdisciplinary research because it moves the attention from discipline-orientation to problem-orientation (see for example Frodeman 2014). New developments in citizen science methods could also be a viable way of doing research (Riesch and Potter 2014). What Dewey adds to our understanding of the functioning of science is a kind of loop that connects practices as a starting point for research with the theories, concepts, and procedures employed to answer the initial problem *and* the consequences this knowledge implies for practices. This loop-like model of research and knowledge constitutes a necessary condition for relevance in Dewey's philosophy of science and democracy.

3. *Expertise that is relevant*

Relevance is not a topic discussed much in philosophy of science or research methodology, at least not explicitly. An exception is Denscombe's book *Ground rules for good research* (2002). He names four types of relevance.[8] Research is relevant because of the subjective motivation of the researcher, its timeliness, its contribution to existing knowledge, and because it meets practical needs (Denscombe 2003: 45-49). The first two types are not good candidates for relevance for obvious reasons: a research topic that would merit the researcher's career is relevant to the researcher, but not necessarily for society in a broader sense. Timeliness is difficult to grasp, and who even decides what is timely research? The two next types seem to be more promising. Accumulation of knowledge and puzzle-solving describe a way of defining relevance that stems from inside

[8] I discussed these four types of relevance in more detail in Gimmler 2020.

of the academia. In fundamental research this model is dominant. Its hallmark is value-neutrality, and this is also its weakness. If relevance is purely dependent upon the accumulation of knowledge, then science is not only neutral to external conditions but possibly not able to address what are matters of concern in society. At least, inner academic relevance cannot be the only criterion for relevant research. The last criterion sounds as if it is close to Dewey's vision of science. The ideal of relevance as meeting practical needs seems to bring academic skills to public problems. However, who defines practical needs? As a general orientation the criterion of needs of society points into the right direction. However, society is a rather broad category and some specification is needed upon how relevance is decided in the interplay between science and society. The formula 'practical needs' hides that these practical needs have to be brought to attention, be formed, and be proceeded. As I already have outlined, Dewey thinks of a well-functioning public as an arena where subjects and topics that are matters of general concern are formed and debated, thus becoming part of research, political decision, and possibly of social reform. A model of the public sphere as Habermas has introduced in his theory of democracy and state of law could be a promising starting point to investigate in depth and to understand how knowledge is distributed and flows between different realms of society in order to keep a public and a democracy alive (Habermas 1998).

The researcher who finds herself in a genuine research situation still has to make decisions regarding which research question is relevant to follow. In relation to the discipline of philosophy, Dewey asks for "a criterion which would enable one to determine whether a given philosophical question has an authentic and vital meaning, or on the contrary, it is trivial and purely verbal; and in the former case, what interests are at stake, when one accepts and affirms on or the other of two theses in dispute" (Dewey 1925: 8). My suggestion is to read Charles Sanders Peirce's pragmatic maxim as such a criterion.[9] The core of the pragmatic maxim consists of a method to understand the meaning of a concept. We know the meaning of a concept if we know what consequences we can expect if the hypothesis about possible characteristics of the object in question is tested in reality: "[c]onsider what effects, that might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object" (Peirce 1935: 402). Instead of merely reflecting about these propositions as such (with deductive logic e.g.), we should start by making hypotheses that are prescriptions for testing and by looking for the consequences of the chosen

[9] For a more detailed interpretation of the pragmatic maxim as a test for relevance, see Gimmler 2020.

propositions. These prescriptions lead us to the possible effects the object of our concept has, and specifically to those effects that 'conceivably have practical bearings'. Usually we can test for direct effects an object has. However, this is not straightforwardly possible for what Peirce calls "practical bearings". It is only on the background of well-chosen hypothesis that effects and possible practical bearings become visible. If we have found the effects that have practical bearings, then 'our conception of these effects is the whole of our conception of the object', and we also have found out which research question (hypothesis) is relevant. Peirce chose the diamond as an example and hardness as its property, thus using a hypothesis that tests for the effects of hardness. These effects, as it turns out, have practical bearings, they make a difference to how diamonds act in relation to other material. The diamond has different practical bearings from, let us say, a lump of amber (which is soft).

As I have outlined elsewhere, "while Peirce used the pragmatic maxim to clarify the meaning of a concept, we use the pragmatic maxim to clarify what kind of research is relevant and which is not. The preliminary answer is: There are good reasons to call research that consists of hypotheses that looks for effects with practical bearings relevant research" (Gimmler 2020). Research is relevant because the practical bearings put us in a situation of uncertainty. In terms of relevance, only those subjects are fruitful research subjects that can lead to hypotheses that have effects in reality which have practical bearings: "[i]f a belief has no consequences – if there is nothing we would expect would be different if I were true or false – then it is empty or useless for inquiry and deliberation" (Misak 2013: 30).

There are several implications related to this use of the pragmatic maxim to clarify the question of relevance of research and I shall only look into those that are closely related to the problem of expertise. The first implication deals with the necessary uncertainty that is connected to research and, therefore, to expertise as well. The reason to start a research process is lack of knowledge, the situation has to be an indeterminate situation. It is important to acknowledge that the research problem is neither unmediated nor directly present in the indeterminate situation. However, what is clear is that the situation has to be one of real doubt. Only real doubt "prompts real inquiry" (Haack 2018: 214). The sign for a real inquiry is that it has practical bearings. An expertise that does not refer to those practical bearings would, from Peirce's and Dewey's viewpoint, be shallow and hollow, not contributing with knowledge that fits to the situation.

This brings us to the second implication, to the notion of 'practical bearings'. While we are not always able to experiment, a viable way to adopt the experimental attitude is to think of knowledge as necessarily leading to practical bear-

ings. Case in point are the broader consequences of certain technologies. The PID (preimplantation genetic diagnosis) has not only the effect of producing a child, but more broadly, has difficult to grasp consequences. As a matter of fact, these consequences are unknown and uncertain. To understand PID properly then includes the inclusion to investigate these uncertainties. This cannot be done without considerable knowledge about the context where the possible effects are played out. To know what PGD means invokes technical, social, and ethical dimensions, and affords starting to think about possible practical bearings that the effect of this technology might have. It then becomes clear that it is the practical uncertainty of how this genetic selection of an embryo would affect our morality and self-understanding as human beings and society that makes an investigation into this technology relevant. To make this point clear: mere uncertainty concerning a technology, a concept, or a model as such is not a guarantee for relevance. But practical uncertainty of known effects is a clear indication that research has met a problem that is of relevance for both science and society. As Habermas also argues, the truth of inquiry "is not derivable merely from logical rules of the process of inquiry, but rather only from the objective life context in which the process of inquiry fulfils specifiable functions: the settlement of opinions, the elimination of uncertainties, and the acquisition of unproblematic beliefs – in short, the fixation of belief" (Habermas 1987: 119). We can infer that irrelevant research has no practical consequences in the context of real life and society. For expertise, the general uncertainty connected to research means that we have to live with the fact that no expertise can give us 100% certainty. What expertise is able to give us is a fuller picture of the possibilities of reality, informed decisions that rely upon the known relation between measures and ends-in-view.

Another implication of the pragmatic maxim that fits well to Dewey's understanding of reconstructed science, social sciences, and humanities lies in the simple fact that researcher can fail and error. Fallibility "can only be corrected by the work of the whole ongoing community of inquirers" (Haack 2018: 214). I have already briefly mentioned new forms of doing research that are developing the traditional collaboration of researchers within the scientific community even further. Interdisciplinary research, citizen science research, or collaboration with citizen organizations, such as in action research (Bohman 1999), are possible new forms of research that could be interpreted as taking relevance of research in the pragmatic sense as a guideline. Expertise never comes in singular. Where there is expertise there is also counter-expertise. From a pragmatic standpoint this is not problematic per se. Dewey would argue that dogmatic and absolutistic understanding of knowledge does more harm than the pluralism of well-performed inquiries.

4. *Conclusionary remarks*

The result of this investigation into expertise by looking into the background conditions for research today and into Dewey's and Peirce's approach to relevant research could be formulated as follows: research and science in the interest of the public have to be in exchange with the public, and at the same time hold on to the scientific principles such as methodological transparency, theoretical and conceptual consistency, testing, and corroboration. Science and research should be part of society and the public sphere. Dewey's argument is radical. He claims that only science in public interest results in 'true' science, in science true to the principles of the scientific method. The expertise stemming from the interplay between science and society is then a proper instrument to guide the ongoing transformations in a democracy. If Dewey had defined what relevant expertise is, I think he would have emphasized two characteristics. The first one I have just mentioned, that knowledge should be instrumental to society and democracy in the way that it guides the transformations all social and political entities undergo. The second one has to do with the method of science. Its characteristics are the controlled intervention of conditions in order to test hypothesis and to know more about the practical bearings of the subject matter of research. This can be done in experiments, in thought experiments, in reasoning, and many other methods, for example inspired by art. The pragmatists would defend the ideal of freedom of research from direct interests and demands in order not to limit the creativity that stems from a research process with its indeterminate situation. Peirce's pragmatic maxim directs our attention towards a practice-oriented concept of knowledge. Only the difference that makes a real difference, one could say, makes research worthwhile and relevant.

Expertise is relevant if it fulfils the function of being part of the interplay between society, the public, and politics. Authoritarian expertise is not in accordance with the principles of science as such and would only go with absolutistic leadership and not democracies. Although Dewey was convinced that the sciences represent the best kind of knowledge that there is to achieve, he would not opt for Brennan's suggestion that expertise should take over political decisions. The rule of scientists, philosophers, or technocrats would be oppressive to what Dewey thinks is the core of democracy, the ongoing transformations, associations, and transactions. He also not only refrains from directly applying expertise to practice, he warns that direct "transformation of scientific findings into rules of action" would serve only partial or short-sighted interests (Dewey 1929a: 9). Dewey cannot be used to justify the commercialisation of research for the reason of utility. As it should have

become clear, problem-orientation is very different from usefulness for at predefined context.

The criterion of relevance is central to Dewey's understanding of science and it also shows to be fruitful to be applied to expertise. Going back to the initial, heuristic definition of expertise I proposed, I can now highlight two pragmatic twists to the preliminary definition. The first is publicity that goes beyond the academic community and the other is the epistemic quality of relevance. Expertise is comprised of knowledge and skills that have been achieved, according to the rules of science (including those of the social sciences and humanities), and in relation to free communications and formation processes that are going on between the sciences, the public, and politics. Expertise has also been questioned and tested (according to the rules of science, social sciences, and humanities) within the scientific community and in the public with the assumption of a general orientation towards truth-seeking. From Dewey's point of view expertise should neither be seen as merely a procedure of legitimation for decisions based on prefabricated facts nor the authoritative judgement of a closed sect. That makes the position of experts in democracies far from easy, as the historian Hirschi, whose remark I used as a starting point for this investigation, also acknowledges. However, for a pragmatist this is the only way of thinking of science and expertise, not as authority and legitimation but as reflection and controlled action in public interest.

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