PUBLIC HEALTH RESEARCH FROM A THEORETICAL SCIENTIFIC PERSPECTIVE

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ABSTRACT

Different scientific traditions represent different epistemological perspectives, and the scientific perspective that you advocate will govern the way in which you view what is being investigated, e.g. a natural science approach would have a completely different focus from a social science one. Since the 1600s, the heyday of rationalism, and towards the twenty-first century, different philosophical directions have developed either as a result of the historical–cultural context of which the philosophers have been a part, or as a reaction to the worldview and/or the dominant political situation in society at the current time. Based on clear connections with both rationalism and empiricism, in this paper I attempt to clarify public health research by a more extended understanding of the concept of rationalism. The discussion is based on Bent Flyvbjerg’s book Rationality and Power (1991), in which the author reflects on how the criteria of good science were seen in the light of Aristotle’s intellectual virtues. The essence in Flyvbjerg’s analysis can be seen as social science research needing to distance itself from approaches using natural science’s episteme (knowledge), rather than initiating creative thought processes to develop satisfying methods to investigate humans and society in the direction of phronesis (wisdom).

Keywords: Public health research, Medical research, Social science, Phronesis, Rationalism

1. INTRODUCTION

Public health is an interdisciplinary field which may be illuminated both through medical research and social science. Medical research has traditionally been placed in a natural science tradition, based on quantitative measurements, whereas both quantitative and qualitative research methods may be applied to social science. The aim of this paper is to shed light on the two scientific traditions that have contributed to the development of public health research as we know it today, and from this draw some lines towards a more extensive approach for achieving adequate knowledge in the field of public health. In the following section, I therefore will begin by elucidating some historical connections from the origin of natural science in the 1600s - until today.

2. RATIONALISM, EMPIRICISM AND PUBLIC HEALTH RESEARCH

2.1 Rationalism - knowledge through nature

Galileo Galilei’s (AD 1564–1642, commonly known as Galileo) interpretation of sunspots was seen as a threat to the foundation of traditional natural philosophy, which had been handed down from Aristotle (384–322 BC) and later modernized by the scholastic philosophers of the Middle Ages. The ancient orthodox belief system of physical nature, and the principle that heavenly bodies had a different base to earth, was challenged by Galileo’s observations and theories [1]. Before the scientific revolution, traditional physics had a human-like character, and explained physical occurrences based on natural movements, whereas the modern natural scientists of the 1600s chose to view nature as a machine.

The ‘natural philosophers’ in the 1600s had various perspectives in their worldview; some defended rational theory, whereas others developed a programme based on an un-theoretical collection of facts and experimentation. In other words, the term ‘nature’ was understood in different ways. In regard to this, Shapin (1996) points to Francis Bacon (1561–1626), who reformed natural theory to include synthetic products, and to Rene Descartes (1596–1650), who claimed that there was no difference between machines created by craftsmen and those created by nature itself.
However, Shapin (1996) is critical of the understanding that the science of the 1600s was transformed to the ‘modern world’ instantaneously through various scientific revolutions, and chooses instead to see scientific development as a natural and continuous process. Even if Shapin argues against the existence of scientific revolution, there has been a great development within natural science since the heyday of rationalism in the 1600s – since Descartes, who denied that common sense and consciousness were the source of true knowledge, and how it is seen in the present day. It can be said that Descartes’ scientific philosophy is the basis of modern natural science in the west, which is stressed by the philosopher Hans Skjervheim (1996), who claims that the modern sciences have evolved within a more or less cartesian horizon. Descartes’ body/soul dualism has had a strong influence on the western conception of nature and natural sciences, and in our relationship with nature. This attitude of objectifying and observing from afar, where human (subject) stands above nature (object), legitimizes the new thinking in natural science [2] and, for example, reproductive technology, euthanasia, cosmetic surgery and medicalization may be used to exemplify different ways in which humans have control over nature in today’s society. The focus on public health issues, e.g. obesity, physical activity, lifestyle diseases, dieting, is another current example of control patterns.

Descartes’ dualism is commonly criticized, because in this we see humans in contrast to and not as part of nature [3]. In its extension, the human as a spiritual being (the soul) is seen outside natural science. In contrast to cartesian epistemology, John Locke claimed that the body was of much more importance compared with other epistemologies emphasizing the soul or mind – and this perspective may have been the seed to inspire many over the last few decades in their arguments for an expansion of this narrow term to include practical and physical expertise as well [4]. According to Locke, physical education was of primary importance for developing an educational foundation. In this regard, the professions of crafts and medical sciences might be appropriate examples from today’s society – as the learning process occurs through action and often without verbal communication.

Based on these considerations, public health research may be placed in a rationalistic scientific perspective. However, on the basis of the many different methodological approaches being used in medical studies, it can also be linked to a different scientific philosophy, namely empiricism.

2.2 Empiricism - knowledge through experience

Empiricism emerged in the 1700s, and is often referred to as being in contrast to rationalism. It advocates that experience is a prerequisite of knowledge, and has had a strong influence on the western world, especially within medicine and parts of the social sciences. The philosopher David Hume (1711–1776) was unambiguously empirical in his thinking, and claimed that true knowledge was based on the experience of the senses. Hume was particularly known for his observations and interpretations of induction and causation, where you draw conclusions from the individual to the general, from single observations to generalized conclusions (theory). Empiricism initially had a scientific approach that was investigated in the 1800s and 1900s and was used on society through positivism.

Positivism occurred as a result of August Comte (1798–1857), the founder of sociology, who wished to separate contemporary social philosophy from its theoretical and metaphysical condition, and create a science that could formulate general and comprehensive laws for the constant relationships between phenomena being investigated. This was introduced by positivism through an empirical mind-set for social phenomena. Positivism involves a certain understanding of experience and recognition, and the meaning of true knowledge, and can consider natural, human, social and cultural phenomena. The basic philosophy in this tradition, ‘Wienerkreis’, was brought forth in the 1920s in what was named social positivism. The logical positivists thought that distinction is about observation and facts, independent of theory, and theory is dependent on observation and facts. According to Gilje (1987), theoretical statements must be reduced to observational statements to be meaningful and have legitimate scientific status [5].

Common to all empirical directions is that they had the same main epistemological thought, the thesis of singular science: all science follows one and the same pattern, namely that of the natural sciences. Physics was the ideal for all science, and the same methodological approach was used when speaking of natural or social phenomena. The goal was that all fields should acquire the mind-set of physics and render the laws of nature in an exact, objective form. Empirical data are therefore actually based on the experience of what can be observed and is
measurable, i.e. what can be counted, weighed and measured – and this implies a certain measure of natural science within the ‘camps of social science’.

2.3 Public health research

Traditionally, modern natural science has been concerned with ‘objective’ quantified information, and tied to the inner processes of the body obtained through equipment. Precision and accuracy are the goal, and measurable relationships and numerical values from tests create diagnostics that can be used to motivate patients, in choosing treatment, and for considering the effect. This development helps to maintain the distinction between body and experience, body and person, and confirms the idea of the distinct separation between the thinking subject and the objective body. By claiming that scientific knowledge can be developed only through physical, observable and measurable phenomena, the empirical directions consider the body as pure science (a natural phenomenon).

Even though natural science may be a crucial prerequisite for adequate and proper healthcare generally, this has been discussed critically in the last few decades [6], and it might therefore be inadequate. Natural science is crucial in the field of healthcare, but it can hardly shed light on the subject’s compound and social character, or its dimensions of opinion. It is argued that medicine is a humanitarian science, because the subject in medicine is sick people. However, if medical subjects also could be explained through humanitarian disciplines, this would require a breach of the empiricist/positivist inheritance: a breach with lack of recognition that disparate phenomena exist in the world. This understanding is supported by Schrödinger (1951), who claimed that the scope, measure and value of natural science are the same as those of any other branch of human knowledge. None has any value or scope on its own, only when seen as a whole. The main responsibility of natural science must be to expand our understanding of the ‘reality’ that surrounds us and to contribute to a greater understanding of ourselves in the world [7].

Foucault (2012) is also critical towards the ideal of objectivity in modern medicine, and argues that medical knowledge through history was revealed through experience-based situations rather than through reading books [8]. He claims that we are too concerned with objective measurements to diagnose rather than through seeing and listening to the individual. This criticism is supported by Mol (2002), who revealed that surgical considerations often preceded the clinical ones, although a clinical approach would have been the most effective and gentle for the individual [9]. This view is supported Moser (2011), who demonstrated the importance of continuous processing and articulation of treatment methods to further develop proper practice for patients with dementia [10]. Furthermore, based on exceedingly international focus on incorporating results reported by patients into clinical research, also Kayes and McPherson (2010) question whether objectivity is synonymous with good science. For example, they claim that an increasing awareness and utilization of mathematically sound techniques within the science of movement, such as responsive theory, Rasch analysis [11], have made it possible to develop solid self-reported methods of measurement with as good a quality as that of more traditional measurements [12].

Hawker et al. (2002) claim that qualitative approaches within medical science are crucial because this tradition would be focused on patients and caretakers. This research would focus on e.g. patients’ experiences with disease and treatment, to what degree concrete medical studies were useful, patients’ and caretakers’ behaviour and attitude, why some patients were unable to complete treatment, etc. However, according to Hawker et al., this knowledge cannot be found through evidence-based medicine. Nonetheless, qualitative research must improve its own methods and analysis to be included in evidence-based research [13].

Based on the aforementioned, the area of public health research is constantly criticized by various sources, depending on from what type of ‘scientific–philosophical’ viewpoint it is seen. The social positivists are criticized by philosophers and researchers who are more qualitatively oriented (as being ‘disloyal’ towards their own through use of scientific methods on humans and society), whereas scientists with a qualitative perspective (to the extent that we can use the term ‘qualitative’ in terms of natural scientists), criticize the most extreme evidence-based research methods within their own tradition. Having said this, it is exactly this discussion via critical analysis and claims that brings forth natural science. In summary, we may conclude that healthcare professionals may be considered to be constantly at the interface of natural science, social science and the humanities.
3. AN EXTENDED AND MORE COMPREHENSIVE UNDERSTANDING OF THE TERM ‘RATIONALISM’

Earlier, I attempted to clarify the main attributes within rationalism and empiricism, and based on these considerations we can justify describing rationalism as a pure scientific tradition, which bases its knowledge on pure quantitative measurements from the external controlled condition to the object being studied, whereas empiricism represents a tradition in the social sciences that wants to explain social relationships using scientific methods. Both of these scientific traditions are concerned with this description, but with quantitative approaches as the field of investigation. Qualitative approaches, i.e. a detailed description of relationships based on subjective meaning in the relationship between people and their surroundings (society), are left in these models of explanation in humanistic or other traditions of social science.

In the following, I will try to shed light on the possible transitions from the traditional rationalism described above, to a philosophical view on rationalism that can be said to further and more extensively represent an understanding of the possibilities that lie in this tradition, in relation to, among other things, public health research. I have based this work on Flyvbjerg’s book *Rationality and Power* (1991), and his reflections on what should be the criteria for good science, based on Aristotle’s intellectual deeds: episteme, techne and phronesis.

Flyvbjerg (1991) claims that the most important task in Aristotle’s studies of humans and society was to develop the rational value system in society balanced against the development of science and technical rationality. Aristotle considered the rational value system to be the most crucial one, and claimed that this should govern the latter. According to Flyvbjerg, this understanding has changed, and the more current focus has been on the technical and analytical rationality within science and society. He claims, however, that this analytical rationality cannot be used on studies of humans and society, because empirical sociology has not yet been possible.

Flyvbjerg seeks alternatives to the rational dominance that has held out since the heyday of positivism in the mid-1900s, and argue that we instead should return via ‘the rational turn’ and learn through the past how we can re-formulate the rational to be more comprehensive. In relation to this, he points out that the founders of rationalism (Plato, Socrates and Aristotle) probably had a more nuanced and varied understanding of the possibilities of humans gaining knowledge about themselves and their surroundings than is the case in modern society – and points out that it is predominantly the interpretations by later generations that have made the old Greeks the founders of rationalism. With this, Flyvbjerg suggests the same as Shapin (1996), namely that we should be careful about drawing conclusions through interpretations from the past because these could be based on incorrect assumptions.

We can clearly understand Flyvbjerg as an anti-positivist when he expresses his scientific view; that modern rational understanding, leading back to Descartes (the technical–analytical view), cannot be used within social science. This criticism of positivism can also be found in Skjervheim (1996). According to Asdal (2005), Skjervheim’s criticism of positivism has been about explaining the main distinction between natural science and the science of humans, and that with this he has marked a distinction between humans and animals, humans and nature. She further claims that Skjervheim’s criticism of positivism was also a criticism of singular science, the belief that all phenomena could be studied through the method of natural science [14]. Skjervheim thereby criticized the positivism of using natural science on humans, and this criticism has contributed to the establishment of its own scientific forum for the disciplines of social science and humanism, with human actors and interactions as the subject matter (Skjervheim, 2002, discussed in Asdal, 2005, p 254).

In addition to the criticism on positivism, Flyvbjerg also suggests a distinction between the rationalist understanding that was applied by Aristotle in ancient times, and the rationalist worldview that characterizes modern natural science. This understanding mirrors Shapin (1996), who claims that the natural philosophers of the 1600s distanced themselves from the divine perspective in their interpretation of natural phenomena. Unlike Shapin, who provides a descriptive representation of scientific development based on ancient times, Flyvbjerg is concerned with going back in time, all the way back to Aristotle’s philosophy, in an attempt to explain the complex relationship between natural and social sciences.

In the next section, I try to convey Flyvbjerg’s thoughts about what we can learn from the current
situation in the society based on Aristotle’s three virtues.

3.1 Episteme: a theoretical, quantitative approach

Episteme (knowledge) is equivalent to the ideal modern science, and comes close to being the only legitimate understanding of what true science is in the twenty-first century. This activity includes invariable knowledge building on a slight connection between theoretical basic science and practical applied science. Intellectual activities, according to this perception, will not be true science, but would strive to legitimize themselves according to this ideal [15].

Based on this description, it is legitimate to view episteme as a quantitative approach in its area of public health research. Quantitative research (natural science) will be understood here not as an intellectual activity, because one stands in an outer relationship to those objects being investigated. In this lie observations, measurement of physiological factors in laboratory research, the relationship between cause and effect in quantitative social studies, and more. Modern medical research, whether speaking of clinical studies on patients in the statistical probability calculations of hospitals, showing different tendencies in a population (e.g. probability of cancer diagnosis if you smoke more than 10 cigarettes a day) or of the significance of exercise for people with high blood pressure, etc., can, according to this understanding, be defined as episteme.

It must, however, be pointed out that Flyvbjerg is critical of the interpretation of episteme as natural science. He means, as mentioned earlier, that social science must liberate itself from carrying natural science as its scientific ideal, and that there should be a compromise including a reflective and distinct development of its role from episteme to phronesis.

3.2 Techne and phronesis: poetic and practical approaches to knowledge

Flyvbjerg (1991) claims that ‘techné’ and ‘phronesis’ are terms that include intellectual work, and that both are related to Aristotle’s notion of truth. Techne (know how/craft) involves the usage of practical rationality in relation to solving concrete problems, and is a skill that can be learned. Examples of techne are arts and crafts. The goal in this practice is the production of a thing; it is concrete, variable and an activity dependent on context. Its goal uses technical knowledge and skills based on a pragmatic middle rationality, by which I mean practical, goal oriented and solution oriented. In relation to this, one should be aware the time that Aristotle shaped these philosophical thoughts around, e.g. techne. What societal role did the production of arts and crafts have in ancient times, and what type of recognition did these products gain? These are questions that cannot be given an exact answer, but in literature we find that it was often about physical skill production aimed at a certain product, e.g. the ability to express life experiences through a piece of art or poetry. The purpose of these products would therefore be hard to transfer and understand in the context of today’s society.

Phronesis puts practical knowledge and ethics in the centre, and deals with an analysis of values as a basis for action. This assumes an interaction between the general and the concrete. The basis of phrnetic research is an analysis of the relationship between values and interests, with the hindsight of societal action, and politics. By politics here is meant what relates to mutual human relationships as members of society and ensuring the interest of the group. Phronesis cannot be defined by universal rules, and application of this virtue demands evaluation assessment and selection – in other words experience [15].

Is it possible, based on Flyvbjerg’s definition of these two virtues as intellectual activities, to assume that they each in their own way represent qualitative approaches within public health research? By qualitative approach is meant an activity that obviously distinguishes itself from the distanced and objectified quantitative approach defined as empiricism, which implies that we try to approach what we wish to investigate with an open and humble mind, that we attempt to grasp the meaningful content within our own context, and that we use evaluation/interpretation/judgement to gain a deeper understanding of the situation.

Seen in the light of Flyvbjerg’s clear division of the episteme as a pure scientific concept without intellectual qualities, it can seem obvious that phronesis, in this activity, implies knowledge/wisdom based on moral considerations and practical experience, and can be utilized as a qualitative research method in its search for knowledge. In relation to techne, however, which among other things deals with technical insight and problem solving, the characteristics of this activity may in modern times be tied to more quantitative
properties. However, as mentioned earlier, one should probably be careful with interpretations of the concepts from Aristotle’s time in the context of our own time, because the meaning and understanding of the content would probably have been entirely different in ancient times. Based on this, I think that we can argue in favour of legitimizing techne as an intellectual virtue that in our time can be understood as a qualitative approach to public health research.

3.3 The significance of the three virtues in public health research

Flyvbjerg (1991) claims that there are few researchers who have reflected on the strengths and weaknesses of social science in relation to their roles as episteme, techne and phronesis, and that this will be the first step towards development of the study of humans and society. He points out that currently researchers seldom define whether they do one or the other, and it is called science even though they are entirely different activities. He further claims that social scientists are not especially interested in methodology – something he argues they should be. One important reason for this is that he seeks the development of guidelines for the interpretation of intellectual virtues in relation to studies of humans and society. Activities that are initially techne or phronesis are rationalized as if they were episteme – something that adds to the uncertainty of what social science is and can do [15]. One example of this can be found with the empiricists who advocate the theory of singular science, i.e. that a natural scientific approach and method can be used for all types of studies. If we should try to transfer this thought to modern medical science, we could, for example, go from the strictly objective evidence-based approach in relation to research, the epistemic activity, and complement this with qualitative approaches, which can then either take place as techne, e.g. in relation to the development of a new system of measurement – a technical insight/solution-oriented activity – or as phronesis – in seeking in-depth knowledge of the primary needs of multiple disabilities in deeper analysis.

Flyvbjerg finally claims that social science, as a result of having tried to practise using an epistemic approach, has failed in its rhetoric and its results. There will still, however, be room for social science as a techne, e.g. in relation to the welfare and treatment of registration, administration, control, management and redistribution of resources between sectors of the population in society. Furthermore, he thinks that it should be a compromise, with the role of social science as episteme including a reflective and clear development of its role as phronesis. The purpose of this type of study of humans and society is not a development in theory, but a contribution to society’s practical rationality considering where we are, where we are going and what we wish for according to different values, interests, etc. The purpose will then be to contribute to society’s capacity for rational thinking and action, and can perish either with the help of empirical analysis or by the evaluations of practical philosophers – or, at best, through a combination of these [15].

CONCLUSION

Scientific theory is a comprehensive field in which one can easily get lost, and there are a variety of philosophical considerations and opinions on how one should approach seeking new knowledge. In this paper I wanted to shed light on the roots of scientific theory, which are the foundation of public health research in modern times, and to try to clarify what guidelines and possibilities are applicable to this research tradition. The essence of Flyvbjerg’s analysis can be seen in that public health research in social science must distance itself from approaches in natural science episteme, and instead initiate creative thought processes to develop satisfying methods for investigating humans and society in the direction of phronesis.

REFERENCES


