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Scientific Survey Research and Unscientific "Layman Polling": Epistemology as a Quality Criterion

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1. Types of polls and the proliferation of layman polling

The Internet makes it easy for everyone to poll people. On the one hand, the advantages of online polling in its various forms (Roessing 2008) are undoubtedly a gain for academic and commercial survey research. On the other hand, the proliferation of non-professional polls and the possible misuse – if not to say abuse – of accordant results poses a problem for professional survey research. This is because most of the public is unaware of the differences between layman polling and scientific survey research. While polls and surveys are not too common on private web pages, they are very popular on high traffic news-sites, internet-portals and some commercial internet pages where the public is regularly confronted with more or less sophisticated online polls (Roessing 2004). It is the purpose of this paper to propose a list of criteria that can be used as indicators to distinguish unscientific layman polling from professional scientific survey research.

Online polls can be divided into three major categories:

1. Professional online surveys conducted by academic or commercial survey researchers.
2. Layman polls aiming at a serious goal – which in many cases is difficult to reach due to lack of methodological skills or technological facilities.
3. Layman polls set up just for fun or entertainment – circumstances which unfortunately do not prevent the use, misuse, or abuse of “results”.

The question to be discussed in the present paper is this: What distinguishes scientific surveys (1) from unscientific fun-polls, and can these criteria be used to decide whether a layman poll can be taken at least somewhat seriously or must be discarded as unscientific.

2. Criteria to divide science from non-scientific approaches to the world

Epistemology is a complex field and in itself no empirical discipline. This means that there is no way to prove or discard epistemological approaches definitely, because they belong to the class of irrefutable philosophical theories (Popper 1989a: 193 ff). Nevertheless, there is at least some consensus among most empirical researchers as to what approaches and methods can be called scientific and which ones have to be regarded as unscientific. It is important to note that *non-scientific* does not necessarily mean *bad*. Epistemology, philosophy or jurisprudence are by no means bad or useless. They just do not meet the criteria for empirical sciences (cf. Popper 1989a; 1989b).

These criteria have been developed in lengthy and intense discussions throughout the history of philosophy. The discussions reached a historical climax during the 20th century in the conflict between logical empiricism (inductionism) and the critical rationalism (falsificationism) (Gorton 2006: 25 ff). This conflict is inextricably associated with the names of Rudolf Carnap and Carl Popper (Popper 1989b).

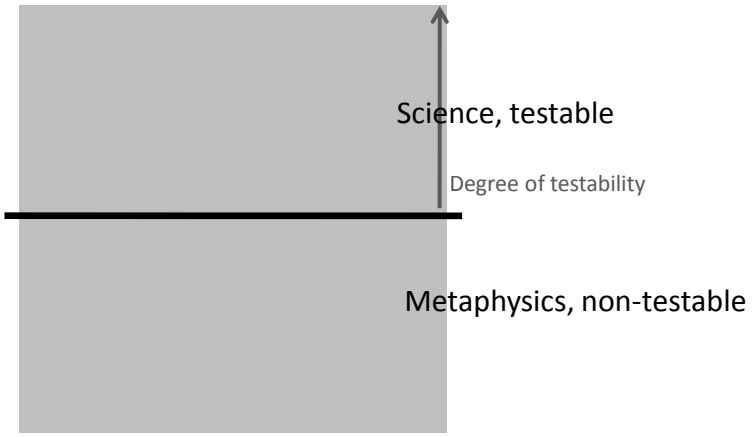
Their problem was this. For most members of the Vienna circle, science was based on observations (Gorton 2006: 25 f) and consisted of meaningful sentences (Popper 1989b: 258 f). From this perspective, observations that lead to sentences about reality, that were logically consistent, would be scientific. Rudolf Carnap was aware that extracting scientific laws from repeated observation can be a hazardous undertaking: After a long series of observations which confirm a scientific finding it is not only possible but quite common that an unexpected finding, a new approach or a better method of observation leads to the falsification of earlier findings. This is why final verification is impossible (Carnap 1969: 28 f). But the logical empiricism suffered from other weaknesses. Karl Popper rejected the idea of a probability calculus of theories and proved it to be mathematically problematic (Popper 2005: 133 ff). Furthermore he refuted the Idea that the demarcation between science and metaphysics was the meaningfulness of scientific sentences (an idea that found its way from Wittgenstein's theoretical approach to language into the epistemology of logical empiricism) (Popper 1989b). These weaknesses along with Popper's intense activities against verificationism surely added to the fact that Popper's sophisticated methodological falsificationism (or newer approaches based on that, like Lakatos' methodology of research programmes, Andersson 1994: 35 ff) today are widely accepted as the basis of empirical science (Roessing 2000).

Popper's argument for the line of demarcation between science and non-scientific approaches is this. "[...] since we should call 'empirical' or 'scientific' only such theories as can be empirically tested, we may conclude that it is the possibility of an empirical refutation which distinguishes empirical or scientific theories." (Popper 1989a: 197). Detailed theoretical consequences of Poppers line of demarcation are not important for the present paper. Therefore, types of theories and their respective characteristics are not discussed here. Instead, an illustration by Popper shall be implemented, because it is very useful to discuss the scientific value of concrete observations, such polls:

"Take a square to represent the class of all statements of a language in which we intend to formulate a science; draw a broad horizontal line, dividing it into an upper and lower half; write 'science' and 'testable' into the upper half, and 'metaphysics' and 'non-testable' into the lower[...]." (Popper 1989b: 257).

Following Popper's directions results in the following illustration that in addition accounts for the different degrees of testability (Popper 1989b: 256):

Figure 1: The line of demarcation between science and metaphysics



Source: Own drawing.

This system can now be used to divide surveys and polls into approaches to social reality that are more or less scientific. A poll like the one cited in the call for papers for the 2008 WAPOR thematic seminar on quality criteria in survey research would have to be placed below the line of demarcation: "Question: 'Administrative reform: progress or farce?' Response alternatives: 'yes,' 'no,' 'don't know.'" This approach is not suitable to test anything. Some 'polls' often used by popular boulevard-media are also mere metaphysics if they deal with the probability of future events: "Who will win the Formula 1 championship?"; "Which country will receive the Football World Cup in 2010?" Since public opinion has nothing to do with chance and failure in sports these questions are not suitable to test a hypothesis about reality (but, of course they would be appropriate to test hypotheses about the confidence of people in their sports-heroes).

Unfortunately, Popper's square with the demarcation line turns out to be incomplete for survey research or the social sciences as a whole. It was pointed out earlier (to be precise: at WAPOR's Cadenabbia-Seminar in 2000) that most reasonably sincere surveys are scientific in Popper's sense, even if no full-blown Theory is put to a decided test. This is because critical rationalism understands even everyday observations as theory-driven (Roessing 2000). So, how can professional polls be distinguished from layman polling? Obviously, there is need for a second dimension, a second line of demarcation to be added in figure 1. It may be called the line of demarcation between weak and strong methods.

3. Weak and strong methods in science and metaphysics

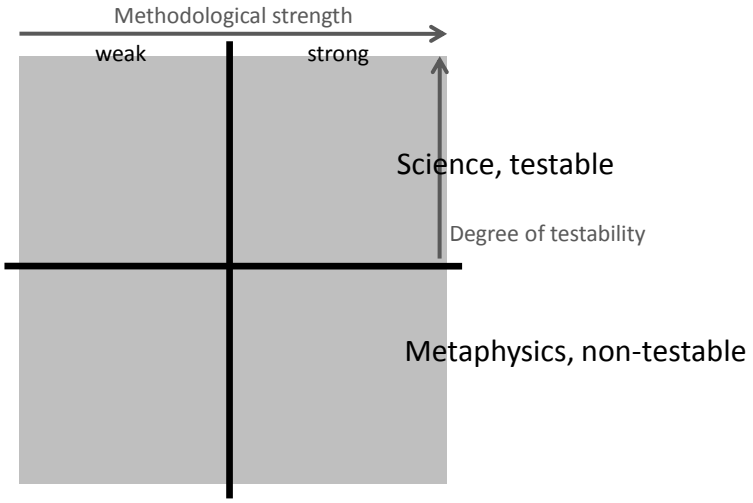
Karl Popper distinguishes three kinds of theories:

- "*First*, logical and mathematical theories"
- "*Second*, empirical and scientific theories"
- "*Third*, philosophical or metaphysical theories" (Popper 1989a: 197)

Each type of theory has its own methodology. The methodology of mathematics is based on logic; in mathematics, it is possible to prove statements to be true or false (although even mathematics provides no approach to total knowledge about truth as was shown in the 1930s by Kurt Gödel , Popper 1989b: 269). The methodology of philosophy is governed by a mixture of logic, hermeneutics and normative argumentation. There are quality criteria for these two types of theories. Figure 2 below is applicable to them. But since it is the aim of this paper to analyse the methodological strength of survey research methods, the following sections discuss the methodology for testing 'empirical and scientific theories' only.

The methodology of the empirical sciences serves the objective to compare conjectures and hypotheses about reality with reality, namely to collect data that either corroborates or falsifies parts of our knowledge about the world. These empirical tests can be stronger or weaker.

Figure 2: Methodological strength



Source: Own drawing.

There are three major criteria for the strength of an empirical test.

1. *Repeatability*. Falsification must not be based on a single observation. For a strong refutation of a hypothesis (or a solid corroboration) detailed directives must be given which allow "anyone who has learned the relevant technique" (Popper 2002: 81) to test it again and again.
2. *Reliability*. Instruments should be designed in such a way that measures are relatively error-free (Kerlinger 1986: 405).
3. *Validity*. Instruments should be designed in such a way that it observes exactly that part of reality that corresponds to the theoretical statements at stake (Kerlinger 1986: 416 ff).

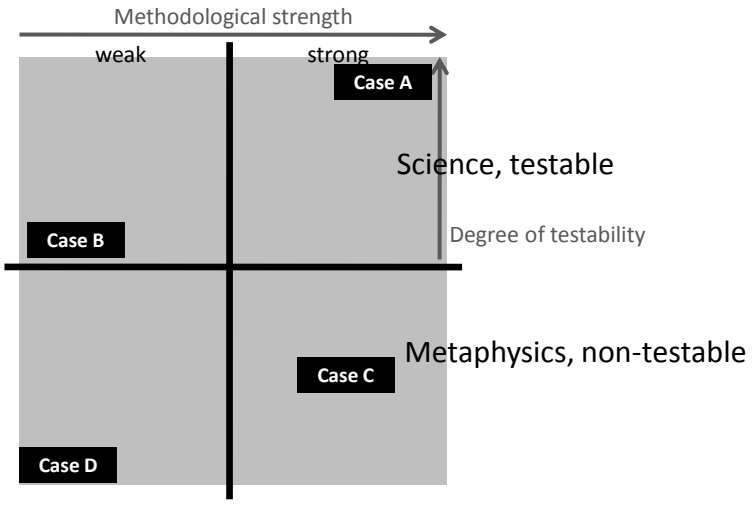
It is now possible to locate different types of polls into the coordinate system that is made up by the two lines of demarcation: the one that divides Science from metaphysics and the one that divides strong from weak methods.

1. *Case A*: A highly testable and methodologically highly developed poll would be one that tests the hypothesis – deduced from persuasion theory: Users of the online encyclopedia

Wikipedia do not care about the lack of reliability of information from this source. Of course the poll (whether conducted online, by telephone or face to face) should be repeatable. Therefore, special attention must be paid to sampling and its questionnaire should be designed to yield reliable and valid results. Professional survey researchers from universities and research companies usually 'have learned the relevant techniques' and thus are able to design such a high-quality test.

2. *Case B*: Someone ('layman') wants to find out if the visitors of his web site are satisfied with the contents he provides. He expects that most visitors would be quite satisfied, but he hopes to get some suggestions for improvement. He knows nothing about the sampling problem of online surveys but uses a well-formulated question and professionally programmed polling software. This approach is scientific but not of high testability; his methods are not complete nonsense (Roessing 2004) but unable to yield repeatable, reliable results.
3. *Case C*: A person who is interested in history wants to know if Communism was a better ideology than Fascism. He sets up an online survey of all history professors in Europe and receives many detailed answers. This approach is non-scientific because the evaluation of an ideology in the dimensions of *good* and *bad* is nothing that can be proved to be wrong by observation. But still, his method is suitable to approve knowledge about history and to answer questions involving values of scientists.
4. *Case D*: As mentioned above: "Question: 'Administrative reform: progress or farce?' Response alternatives: 'yes,' 'no,' 'don't know.'" Approach and method are complete nonsense. It is definitely not scientific to "make haphazard observations which follow no plan" (Popper 1989a: 189).

Figure 3: The examples drawn into the coordinate system



Source: Own drawing.

4. Conclusion

This paper is an attempt to show that from Popper's distinction between science and metaphysics as well as from the well-known methodology of survey research, a system can be constructed that serves two purposes: First, the differentiation of more or less scientific ('testable') approaches and second, the differentiation of more or less suitable methods to test these approaches or to gain other kinds of knowledge about non-scientific approaches to reality. A more detailed definition of method-quality and a more sophisticated discussion of the value of nonscientific approaches is already planted in the writings of Popper, Lakatos and the vast quantity of methodology textbooks. Its extraction for the purposes of survey research however, is reserved for future papers.

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