Logical positivism: influences on philosophical, theological and scientific inqui...

Logical positivism was a movement that was officially established in the small Vienna Circle in the 1920s. The group of 11 mathematicians, scientists and philosophers met regularly to discuss and campaign for a change in philosophical discourse. Rather than the metaphysical and normative pretensions that epitomised philosophy throughout Europe, the group advocated for a systematic reduction of knowledge to logical and scientific foundations.

Despite having been widely criticised for its extreme empiricism and subsequent dismissiveness of entire fields of thought, logical positivism has had a lasting impact in the way we consider epistemology and processes of inquiry. Three fields have seen paradigmatic change in their aims, methods and conclusions in acquiring knowledge, those being the study of the physical, natural & social sciences, theological inquiry and the study of philosophy itself. This essay examines through writings of logical positivists how traditional views have been challenged and changed, looking at specific issue areas within these three fields. Perhaps the best way to understand the forces behind the movement of logical positivism and also its place in the history of philosophy of science is through a brief look at the idea’s that influenced and led to the inception of logical positivism, starting from the 18th century. This century saw a fundamental change in the way science was viewed.

With the huge success of several scientists during the century, including the achievements of Isaac Newton, science had gained a newfound credibility in producing theory of great accuracy and importance in terms of understanding the world. How science had produced such successes was a

fundamental question in assessing scientific method and was also highly relevant because of the demise of religious power and a willingness of people to turn to a new system of thought. Immanuel Kant and David Hume were philosophers interested in the rise of science and its implications for knowledge and understanding. Immanuel Kant, in Critique of Pure Reason (1781), suggested that many of the questions brought about by theological and metaphysical study were beyond comprehension of the human mind. Rather trying to make conclusions about God, the Soul, the Universe and so forth was impossible as it was simply beyond our cognitive capacities. Instead he argued we should set out ‘ bounds of sense’ and restrict our investigation to what was within these capacities.

Kant’s predecessor, David Hume, articulated similar ideas in his Enquiry Concerning the Human Understanding (1748) suggesting that these ‘ bounds of sense’ were defined by what we could reveal through empirical investigation and experimental reasoning: If we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask, Does it contain any abstract reasoning concerning quantity or number? No. Does it contain any experimental reasoning concerning matter of fact and existence? No. Commit it then to the flames: for it can contain nothing by sophistry and illusion” 1 While criticised for its radical empiricism, Hume’s attitude was important in inspiring the logical positivists value on empirical fact and clear, unambiguous meaning. Specifically, the dismissal of divinity and metaphysics became a particular focus of the logical positivists and while being highly controversial with traditional philosophers and theologians

are areas in which the movement has made a significant impact in ways that will be later examined.

The term ‘ positivism’ came from the philosopher August Comte (1798-1857) who studied the evolution of epistemology. Through history he argued there were three unique phases by which humans searched for understanding. The oldest and most traditional of these phases was theological inquiry involving God and other spiritual forces as the source of understanding (communicated to people through revelation). Less widespread but still with significant historical roots was the phase of metaphysics as a source of knowledge involving philosophical truths being revealed through a process of contemplation, thought and discussion. For Comte, it was the third ‘ positivist’ phase that would now come to dominate after the 18th century scientific revolution. This was characterised by scientific knowledge where empirical facts attained through experimentation and experience became the basis of such ‘ truths’2 Of greatest direct inspiration for the Vienna Circle was Ludwig Wittgenstein who published his Tractatus Logico-Philosophicus in 1918, which later became a ‘ pseudo-textbook’ for the logical positivist movement.

Although suggesting like his predecessors that our knowledge had definite limits, Wittgenstein disagreed with Kant that this was because of our limited cognitive capacities. Rather he suggested that specifically understanding was restricted by what ideas natural languages could express. Simply, our language limits how we can think about, and express, concepts and ideas thus limiting our acquisition of knowledge. As Wittgenstein explains, the aim of Tractatus Logico-Philosophicus was to find this limit and in doing so set

what Kant described as the ‘ bounds of sense’: The book deals with the problems of philosophy, and shows, I believe that the reason why these problems are posed is that the logic of our language is misunderstood .

.. he aim of the book is to set a limit to thought, or rather -not to thought, but to the expression of thoughts. It will therefore only be in language that the limit can be set, and what lies on the other side of the limit will simply be non-sense. 3 Essentially the Vienna Circle tried to fulfil the challenge that Wittgenstein had set – to set a limit to what can and cannot be discussed through an analysis of the limitations of language.

The group itself emerged in the early 1920s with Moritz Schlick becoming professor of philosophy at the University of Vienna. Rather than an organised movement, Schlick along with 10 others, met as a ‘ club’ regularly to discuss certain problems based on logic and the ideas of language discussed in Wittgenstein’s Tractatus. By 1929, the group published its manifesto translated as ‘ The Vienna Circle; Its Scientific Outlook’ which outlined the problems they sought to explore in the philosophy of mathematics and the physical & social sciences. Over the next ten years the group held conferences, published journals and the circle expanded throughout Europe. Essays by the eleven members were distributed widely and the popularity of the movement grew though in the face of many opposed to its strict principles.

However by the 30s, the Vienna Circle itself was in the process of dissolution. The founding members were being met with increasing hostility by other members of the philosophical and scientific community because of their

debunking of fundamental ideas and assumptions in particular areas of study (for example, metaphysics, Marxism and psychoanalysis). Also, alliances that had been formed with philosophical schools in Berlin and Poland collapsed with the advent of Nazism, with many of the members being forced into exile. Consequently the group lost a lot of its coherence and despite the influence individuals continued to make in the area of logical positivism, by the end of World War II the Vienna Circle had essentially broken up. 4 The movement of the logical positivists was viewed as a revolutionary change in what the purpose of philosophical study was to become.

As suggested by Comte’s 3 phases of acquiring understanding mentioned earlier, the positivists saw that the purpose of philosophy was to study language and its meaning. This linguistic analysis would allow for a means of finding restrictions on what we can understand and through this, draw distinctions between what constituted sense and what could be classified as meaningless and thus not worthy of discussion. Mortiz Schlick went as far as to suggest that this linguistic analysis would essentially end all conflicts of philosophy as it provided the perfect tool to demarcate what was worthy of discussion and what was not: For I am convinced that we now find ourselves an altogether decisive turning point in philosophy, and that we are objectively justified in considering that an end has come to the fruitless conflict of systems. We are already at the present time, in my opinion, in possession of methods that make every such conflict in principle unnecessary.

What is now required is their resolute application. 5 The specific ideas that allowed for this demarcation between the relevant and the useless are best

articulated in Rudolf Carnap's The Elimination of Metaphysics Through Logical Analysis of Language (1932). One of Carnap's main goals of the paper was to show that attempts at explaining what was beyond our ' bounds of sense' would only result in the formation of meaningless statements, i. e.

the creation of a sequence of words that do not constitute a statement either through misuse of grammar or the confusion about the meaning, and appropriate use, of particular words. While incorrect grammar is usually easily recognised as creating non-sensical statements, it is the use of ' pseudo-concepts' that have the same effect but are often well disguised as meaningful. Carnap set three criteria necessary for a word to be established as having meaning. Firstly the definition of the word must be arrived at through induction, i. e.

a series of specific observations must allow one to come to a specific definition of what is being described. Following from this there must be conditions under which the word applies (meaning it is supposed to be true) and conditions were it does not (and thus it is false in the context of application). Finally, and further characterising Carnap's empirical conditions for meaning, the word must be able to be verified (a concept that will be explored more closely later). If these criteria are not satisfied, we are presented with a pseudo-concept, which are used to form pseudo-statements. A pseudo-statement, as described by Carnap, " looks like a statement, does not assert anything, expresses neither a true nor a false proposition" 6 and thus becomes meaningless – neither right nor wrong but non-sensical and meaningless.

As suggested by the title, Carnap relates this discussion of meaning in the “ elimination of metaphysics”. As described by Carnap, “ in the domain of metaphysics, including all philosophy of value and normative theory, logical analysis yields the negative result that the alleged statements in this domain are entirely meaningless” 7. Carnap uses the example of the term “ principle” as one of these meaningless terms that is nevertheless discussed widely by metaphysicians. According to Carnap, metaphysicians fail to find a meaning of ‘ principle’ that satisfies the criteria that is considered necessary for a meaning to exist.

Rather than providing a definition, other similar metaphysical concepts are alluded to or analogies are made between actual empirical concepts and the intangible, unobservable metaphysical concept, “ but the word does not thereby become meaningful; and it remains meaningless as long as no method of verification can be described” 8. This meaninglessness applies to all metaphysical concepts as essentially the purpose of metaphysics is to describe that nature of existence and knowledge in a way that goes beyond the empirical and thus by the criteria of logical positivism, the entire field of study is deemed meaningless. While ruling out metaphysics on the logical grounds described, Carnap simultaneously showed a new direction for philosophy similar to Schlick’s view as described earlier on. Carnap recognised that by reducing questions of meaning down to their empirical nature and dismissing all others, he had to some extent undermined the whole study of philosophy.

However in the following passage, he is seen to give a new prescription for what it is that philosophy is to achieve: But what, then, is left over for

philosophy, if all statements whatever that assert something are of an empirical nature and belong to factual science? What remains is not statements, nor a theory, not a system, but only a method: the method of logical analysis ... It is the indicated task of logical analysis, inquiry into logical foundations, that is meant by ‘ scientific philosophy’, in contrast to metaphysics9The core problems associated with the study of metaphysics were also recognised by the logical positivists as being prevalent in theological study with many of the positivists deeming talk of God and other spiritual bodies as meaningless because many fundamental ideas of religion existed beyond our sense experience. These ideas are, again, examined by Carnap in The Elimination of Metaphysics representing the comparison for the positivists between metaphysics and questions of religion. For logical positivists the obvious problem in dealing with the meaning of God is the fact that it exists beyond the domain of our own reality thus how we define it, the form that it takes and how we verify its existence (all as criteria for ‘ meaning’) all become meaningless questions because answers cannot be found through any real means.

From this empirical perspective, ‘ facts’ are simply statements about the sensory realm. This means that a statement such as ‘ God exists’ is really a statement about the person who says it rather than any referent. In trying to give meaning to the statement ‘ God exists’ the test of meaning sees a failure in all three criteria. There is nothing we can point to that suggests the work of God because there is nothing we cannot point to and similarly suggest as intervention of the Deity. Thus God is not described in any real way and without description, verification becomes equally impossible.

While this view is quite extreme in its dismissal of discussion about the existence of God, some theologians have recognised the importance of the arguments. This is seen in T. R. Miles' Religion and the Scientific Outlook: The adoption of a religious belief is a matter for person rather than rational proof.

Religious insights can still be very profound even when they cannot be supported by argument ... [but] the arguments, if correctly formulated, cannot deprive us of anything in religion that is worth keeping; but they force us, whether we like it or not, to reconsider the appropriateness of some of the things we say about God. 10 As can be seen so far, language and meaning play a hugely important role for the logical positivists in their discussion of philosophy and theology.

It is through an examination of the logical positivists and their relationship with the study of physical and natural sciences however, that their wider empirical position is revealed. The legacy of the logical positivists that dominates most today is probably their discussion of the importance of verifiability and the subsequent debate about Falsifiability. This sections examines these concepts in relation to the logical positivists and shows the impact of these in relation to contemporary science A. J. Ayer's Language, Truth ; Logic (1949) was the first English text that restated many of the concerns of the Vienna Circle, in particular the anti-metaphysical arguments that drew inspiration from the work of David Hume. Language, Truth ; Logic was also very important in clearly looking at the role that verification played in creating credibility for theory.

As stated in the text, “ The criterion which we use to test the genuineness of apparent statements of fact is the criterion of verifiability” 11. As has been briefly discussed in an earlier section, verificationism proposes that assertions are meaningful only when their content meets a minimal condition – either they are empirical observations of the natural world or tautologies (true by definition for example the language of logic and mathematics). This principle of verification has been very important in directing the scientific method to rely on observation-based evidence and, as is discussed shortly, has had significant impact particularly in the method of psychological research. It is important to note though that despite the stringent criteria that is explicit in the theory of verification, there are several important modifications made by Ayer that strengthen the theory and avoid radical empiricism.

For example, Ayer distinguishes between ‘ strong’ and ‘ weak’ verification where strong verification is what we consider to be the obvious meaning – that an idea is verified as truth is conclusively established through experience. The weak criterion involves being able to suggest evidence that would lead to strong verification. This concept is important for theories such as Einstein’s where attaining evidence is beyond capabilities, but the legitimate idea of what is needed and such evidence can be foreseen, is enough to prove the theory credible or, at worse, only probable. 12 In conjunction with verifiability, Karl Popper added a new test that could be used to give theory reliability and allow it to pass the ‘ sense’ test. Popper was not a member of the Vienna Circle and did not like the idea of being classed as a positivist however as Ayer argues, “ the affinities between him

and the positivists whom he criticised appear more striking than the divergences” 13. In Conjectures & Refutations (1963), Popper offers criticism about the process of verifiability through its inability to ever produce full accuracy.

Despite however many positive cases are found to support a statement, this never serves to show that the negatives cases to do not exist. Rather then, attention should be turned to finding these negative cases through considering what they would have to be in order to show the theory false. More simply, a test of Falsifiability involves suggesting conditions which would prove the theory false and thus proceeding to show that these conditions don’t exist. Falsification now plays a very important role in the validation of scientific theory and though based around criticism of logical positivism, owes its inception to the positivist movement that appealed to such empirical criteria. A specific look at the field of psychology as part of science reflects the lasting impact of positivism. Popper’s comments on psychoanalysis in Conjectures & Refutations (1963) reflect the impact of Falsifiability, and more generally positivism, in relation to the field of psychology, specifically Freudian theories: It was precisely this fact – that they [Freudian and Marxist theories] always fitted, that they were always confirmed – which in the eyes of their admirers constituted the strongest argument in favour of these theories.

It began to dawn on me that this apparent strength was in fact their weaknesses. 14Popper here suggests that psychoanalysis contained meaningless terms because while it seemed that the theory could point to anything as an explanation, this was exactly the problem but one that could

be answered to through the logic of falsification – what behaviour could be seen not to corroborate with the theory? This is also applicable to the question of God's existence discussed earlier. While religious people may say verification is in the existence of our surroundings (as God is the creator of this), falsification bears relevance because it asks in what situation would it be possible to say God did not exist. This becomes impossible to answer and thus fails the test of falsification.

Such criticism of psychoanalysis reflected the positivist's attitude to psychology in general and, before Popper's rise to prominence, had caused one of the greatest changes that positivism caused within the study of science. As has been described, the positivist movement made clear that factual theories were those about actual objects, processes and structures in the real world. It is through logical positivism then that psychology took on the assumption that to be ' real science' only observable entities using empirical data could be used to draw conclusions and make inductive theories. It was these assumptions that led to the emergence of behaviourism in the 1930s led by the American B. F. Skinner.

Behaviourism argued psychology should focus only on that which could be observed, while discussion of the mind, subconscious and concepts such as Freud's ego, superego and id were meaningless. This attitude laid down the rules for scientific enquiry that shaped the training of several generations of psychologists. The culture of encouraging experiment, control, objective observation, recording, precise definitions of behaviour and statistical analyses of results held in such regard today can thus be traced back to the emergence of behaviourism, which in itself resulted from the logical

positivist tradition. 15 Much of the logical positivist movement has been criticised widely for it’s emphasise on the consequences of a strict application of the positivist program to what have been traditionally highly valued, worthwhile areas of study.

It caused even wider controversy in the way many misinterpreted the theories of theology as undermining the structure of religion despite this not being the purpose at all. However while the stringent approach to what is worth investigation and what is not may be perceived as an unnecessary limitation on our knowledge capacities, as well as diminishing value in free-thought, logical positivist is not without its merits. Agendas have been better set for areas of science, philosophy and theology through a clearer distinction between what processes and issues will allow for formal conclusions and which will lead only in circles. Importantly also is the setting of normative goals that have allowed for greater integration of all three fields of study creating an enhanced ‘ unity of science project’ and thus better communication and interaction within the community of inquiry. It is this unity that shows how logical positivist approach can be applied to almost all areas of inquiry and it is this that has allowed its growth from humble beginnings with the small, informal Vienna Circle to the much wider global community where the group’s influence remains.

Thus it is without doubt that the logical positivist movement proved hugely influential throughout the twentieth century and is likely to do so into the twenty-first.