

Investigator Bias and Theory-Ladenness in Cross-Cultural Research: Insights from Wittgenstein

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A relatively under-explored topic in the current literature on and methods for research in the field of comparative and international education is the problem of investigator bias in cross-cultural research. This article discusses the nature of and an approach to address investigator bias in research that originates from the theory-ladenness of observation. Theory-ladenness essentially holds that everything one observes or perceives is influenced by and interpreted through one's existing beliefs, values, assumptions and expectations. This article explains how the philosopher Ludwig Wittgenstein's exposition of belief system – what he calls 'world-picture' – illuminates our understanding of investigator bias and theory-ladenness by elucidating the organisation, inculcation and revision of beliefs. It is further proposed that comparativists confront the challenge of investigator bias by critically reflecting on their world-picture, the impact of their world-picture on their theoretical commitment and research process, and the evaluation and revision of their theory through the interaction between theory and data.

Introduction

A variety of conceptual tools and methodologies has been adopted by scholars in the field of Comparative and International Education (CIE). To date, there is a strong tradition within the CIE field of utilising and integrating diverse disciplines, such as science (e.g., positivism), sociology (e.g. externalisation, loose coupling) and even medicine (e.g. the epidemiological model of global dissemination) (Epstein, 2008; Steiner-Khamsi, 2014). However, relatively less attention has been devoted to philosophy as a source of or inspiration for innovative methods in the CIE field. Drawing upon philosophical writings, this article examines the problem of investigator bias that originates from the theory-ladenness of observation, and proposes an approach to address this problem in research. Besides referring to the literature in the philosophy of science, this essay turns to the works of the philosopher Ludwig Wittgenstein to elucidate the essential qualities of belief system and its implications for theory-ladenness and investigator bias.

The paper begins by highlighting the challenge of investigator bias in research and its connection to theory-ladenness. This is followed by an exposition of Wittgenstein's views on belief system and a suggested approach for researchers to avoid or minimise the effect of investigator bias. The example of research on China will be given as an illustrative case study.

Investigator Bias and Theory-Ladenness in Cross-Cultural Research

A perennial problem faced by researchers, including comparativists, is the effect of investigator bias in research. In simple terms, investigator bias refers to “errors in study design, implementation, or analysis by the investigator” (Aparassu & Bentley, 2015, p. 51). O’Neil and Nicklas (2014) point out that conflicts of interest such as “funding sources, selection of study participants, hiring of personnel, purchase of equipment, choice of analyses, and interpretation of the data” may occur when a personal consideration compromises or appears to compromise the integrity of the study in any way

(p. 41). For example, a biased researcher might interpret study results in ways that favor the funding agency (*ibid.*). The focus of this essay is the effect of investigator bias that originates from the *theory-ladenness of observation*.

Theory-ladenness affects all researchers and applies to all disciplines. Theory-ladenness essentially holds that everything one observes or perceives is influenced by and interpreted through one's existing beliefs, values, assumptions and expectations. Philosophers of science, in particular, Norwood Hanson (1958), Paul Feyerabend (1969) and Thomas Kuhn (1962) contend that our observational evidence, far from being theory-neutral, is shaped by our paradigms and theoretical commitments (Bogen, 2014). Heidelberger (2003) highlights two forms of theory-ladenness: psychological and conceptual. The former refers to the psychological law that human perception is always guided by prior beliefs and expectations; the latter foregrounds the prior theories held by researchers by asserting that "the meaning of the observational terms involved depends upon the theoretical context in which they occur" (*ibid.*, p. 138).

The phenomenon of theory-ladenness affects not just research in natural sciences but also that in the social sciences, including the field of CIE (for further discussion on theory-ladenness in natural and social sciences, see Hunt, 1994; Brewer & Lambert, 2001). The Japanese comparativist Takayama (2011) claims that "any representative work necessarily reflects the researcher's subjective positionality which privileges given voices and excludes others" (p. 461). Comparativists are especially susceptible to investigator bias since they bring with them not only their subjective positionality but also their own cultural worldview and presuppositions that may differ from or even clash with those under study. Investigator bias is particularly relevant to research on policy borrowing where "scholars in policy transfer research tend to draw from education systems in the First World to make generalizations on policy borrowing and lending in the rest of the world" (Steiner-Khamsi, 2006, p. 675; also see Carney, Rappleye & Silova, 2012; Wiseman, Astiz & Baker, 2013). Such generalisations may promote 'cross-cultural cloning' and 'false universalism' where the researchers – who themselves were socialized into and/or trained in the education systems in the First World – impose their own paradigms on the subject they are studying in a different cultural context (Nguyen et al., 2009).

It is important to note that theory-ladenness is not an all-or-nothing phenomenon but instead comes in various degrees. Without entering into discussion of the complexities inherent in and overlaps between labels, we may identify two main types of theory-ladenness that occupy two ends of a spectrum: a radical/strong version and weak version. The *radical or strong* version of theory-ladenness claims that all our observations are influenced by and interpreted through our existing worldview to such an extent that it is impossible for us to objectively evaluate the significance of an observation for a theory. This extreme form of theory-ladenness, according to philosophers such as Hanson (1958) and Kuhn (1962), gives rise to incommensurability in research: the position that we cannot compare experimental results because these results reside in different paradigms that ascribe different and incompatible theory-laden meanings and observation language to the results (Franklin et al., 1989).

Contrasting with the radical/strong version is a *weak* version of theory-ladenness that holds that our observations, although influenced by and interpreted through our existing paradigm, are open to objective evaluation and revision. Focusing on this form of theory-ladenness, Freeman and Smith (1996) conclude from their empirical research that there is no "complete subordination of observation to the demands of prior theory" since "data can have an evidential impact on the credibility of a theory even when the

observations in question are influenced by the theory” (p. 326). In other words, our perceptions are jointly influenced by the objective relations in the observational data and our prior theories. It follows that theory-ladeness, at least in its less extreme forms, does not necessarily pose a problem for researchers, since the researcher’s prior theoretical commitments are potentially open to evaluation and revision. Theory-ladeness is only detrimental to research if it results in investigator bias – where the researcher imposes one’s existing beliefs, values, assumptions and expectations on the research subject, ignores the evidential impact of data (especially evidence that contradicts one’s expectations), and draws conclusions that are aimed at reinforcing one’s ideological preferences.

Some scholars have suggested reducing the effect of investigator bias through triangulation of research findings (e.g. see van Maanen, 1983; Miles & Huberman, 1994; Merriam, 1998; Shenton, 2004). But triangulation, although helpful, is insufficient as a researcher may still observe and interpret the data obtained from different sources through theoretical assumptions and biases. In other words, triangulation, in itself, does not address the root cause of investigator bias: the influence of the researcher’s presuppositions, convictions and expectations on one’s research that leads to errors in the inquiry process and outcome. What is needed is a deeper understanding of how investigator bias occurs and how it can be avoided or at least minimized by the researcher.

Wittgenstein on Belief System

The writings of Wittgenstein are pertinent to our topic as his exposition of belief system contributes to our understanding of the nature of beliefs, belief acquisition, and the relationship between belief system, theory-ladeness and investigator bias. Wittgenstein (1889–1951) was an influential twentieth century philosopher whose works have a major impact on the development of modern philosophy. Space constraint means that an exploration of Wittgenstein’s views, including their diverse interpretations and controversies, will receive less discussion than they deserve (for an in-depth analysis of Wittgenstein’s views in the context of philosophy and education, see the collection of essays in Smeyers & Marshall, 1995). This article shall concentrate on his views taken from the book *On Certainty* (Wittgenstein, 1969) where the discussion was situated against a backdrop of a philosophical debate on skepticism.

Wittgenstein begins by observing that a person’s “convictions do form a system, a structure” (*On Certainty*, # 102, all subsequent citations are taken from this book, unless otherwise stated). By referring to a system or structure, Wittgenstein reminds us that beliefs do not exist in isolation but find coherence and support within a web of beliefs. He elaborates, “When we first begin to *believe* anything, what we believe is not a single proposition, it is a whole system of propositions” (# 141, 142, italics in the original). He calls this system or structure a ‘world-picture’ or “my picture of the world” (# 94). A world-picture comprises “the substratum of all my enquiring and asserting” (# 162) and “the matter-of-course foundation” of one’s research (# 167). To explain the domination of a world-picture, Wittgenstein gives the example of chemist Antoine-Laurent Lavoisier:

Think of chemical investigations. Lavoisier makes experiments with substances in his laboratory and now he concludes that this and that takes place when there is burning. He does not say that it might happen otherwise another time. He has got hold of a definite world-picture – not of course one that he invented: he learned it as a child. I say world-picture

and not hypothesis, because it is the matter-of-course foundation for his research and as such also goes unmentioned. (# 167)

It is instructive that Wittgenstein distinguishes between a world-picture and a hypothesis. The latter is “something to test by experience” whereas the former is “a rule of testing” (# 98). In other words, a world-picture cannot be empirically tested and is “the inherited background against which I distinguish between true and false [hypotheses]” (# 94).

Wittgenstein alludes to theory-ladenness when he asserts, “All testing, all confirmation and disconfirmation of a hypothesis takes place *already* within a system” (# 105, italics added). A world-picture encompasses the beliefs, values, assumptions and expectations of a researcher that determine one’s observations, perceptions and interpretation of data. In the case of Lavoisier, his conclusion that “this and that that takes place when there is burning” is theory-laden in the sense that it is influenced by his prior world-picture concerning chemical compounds. Wittgenstein’s concept of world-picture helps us to understand why observational evidence is not theory-neutral but inevitably circumscribed by and interpreted through an existing worldview. The notion of world-picture also explains why the theory-ladenness of observation is both psychological and conceptual: we are mentally and emotionally inclined to rely on our existing world-picture for all our observations and perceptions, and our prior theoretical commitment which is grounded in our world-picture determines the meaning of observational terms for our research.

Another example by Wittgenstein demonstrates the pervasiveness of theory-ladenness, this time (ironically) for Wittgenstein himself. The example involves an adult telling a child that he has been to the moon. The child believed in the adult and proceeded to tell another adult about it. Pointing out the absurdity of the claim made by the first adult, the second adult told the child that what the first adult said was “only a joke, the man hadn't been on the moon; no one has ever been on the moon; the moon is a long way off and it is impossible to climb up there or fly there” (# 106). Wittgenstein adds that the child, upon hearing this, would not ordinarily stick to such a belief and would soon be convinced by what the second (or any other) adult told him (*ibid.*). It is a significant point that this example was written by Wittgenstein in 1950-1951 before Neil Armstrong’s historic mission to the moon on July 20, 1969. Hence it is understandable why Wittgenstein himself dismissed the claim that some adult had been to the moon. Wittgenstein’s own world-picture of the impossibility of human beings setting foot on the moon exemplifies theory-ladenness: it shapes his interpretation and judgement regarding the reasonableness of the before-mentioned claim at the time of his writing.

On the question of how beliefs are acquired, Wittgenstein likens belief inculcation to learning a game. He posits that propositions describing a world-picture function like “rules of a game” that “can be learned purely practically, without learning any explicit rules” (# 95). He avers that human beings do not learn the practice of making empirical judgments by learning rules; rather, we are taught “judgments and their connection with other judgments” (# 140). Wittgenstein’s point is that human beings acquire beliefs spontaneously through social practice rather than rule-learning. Put otherwise, we are initiated and socialised into the world-picture of the community that we belong to. The natural and continuous existence of world-picture accounts for the inescapable and permeating impact of theory-ladenness for human beings. The world-picture, with its totality of beliefs, values, assumptions and expectations, becomes our “inherited background” (# 94) for all our convictions and actions.

Wittgenstein's distinction between two types of beliefs within the world-picture further illuminates the characteristics of theory-ladeness:

The child learns to believe a host of things. I.e. it [sic] learns to act according to these beliefs. Bit by bit there forms a system of what is believed, and in that system some things stand unshakeably fast and some are more or less liable to shift. What stands fast does so, not because it is intrinsically obvious or convincing; it is rather held fast by what lies around it. (# 144)

The two types of beliefs are beliefs that are liable to shift and those that stand unshakeably fast. Wittgenstein uses the analogy of sand and hard rock on the bank of a river to underscore the difference between the two types of beliefs. Beliefs that are liable to shift are like the sand that gets washed away or deposited, whereas beliefs that stand unshakeably fast are like the hard rock that is "subject to no alteration or only to an imperceptible one" (# 99). The two types of beliefs are not dichotomous or immutable. Wittgenstein states that "there is not a sharp division" between the two types of beliefs and that "the river-bed of thoughts may shift" (# 97). He adds that "fluid propositions" [beliefs that are liable to shift] may be "hardened" while the "hard ones" [beliefs that stand unshakeably fast] may become "fluid" (# 96).

The two types of beliefs account for the two versions of theory-ladeness mentioned earlier: radical/strong and weak. A researcher whose theoretical commitment rests primarily upon beliefs that stand unshakeably fast is likely to be vulnerable to the radical/strong version of theory-ladeness, whereas another researcher whose theoretical commitment is premised largely on beliefs that are liable to change is more prone to the weak version of theory-ladeness. In the case of the radical/strong version of theory-ladeness, incommensurability of experimental results may arise if two or more researchers subscribe to competing theories that are both underpinned by beliefs that stand unshakeably fast. In such a situation, the competing theories shape the respective researchers' perceptions, resulting in mutually incompatible theory-laden meanings and observation language for the same set of data. In contrast, incommensurability of experimental results is less likely to take place if at least one researcher subscribes to the weak version of theory-ladeness; the presence of underlying beliefs that are liable to shift allows the possibility for that researcher's theory to be questioned and modified.

It is important to note that a world-picture is not unchanging and unchangeable. Wittgenstein maintains that "what men consider reasonable or unreasonable alters" (# 336) and that "a language-game does change with time" (# 256). A language-game, according to Wittgenstein (1953), consists of "language and the actions into which it is woven" that is supported by a world-picture (*Philosophical Investigations*, # 7). He expands on the prospect of changing one's language-game:

Certain events would put me into a position in which I could not go on with the old language-game any further. In which I was torn away from the *sureness* of the game. Indeed, doesn't it seem obvious that the possibility of a language-game is conditioned by certain facts? (# 617, italics in the original)

Commenting on the above quote, Bax (2011) points out, "that *On Certainty* explains world pictures as open and dynamic does not only mean that it allows for difference and divergence to occur naturally and accidentally; it also indicates what opportunities there

are for knowingly disengaging oneself, if only temporarily, from the world picture one has inherited" (p. 136).

But the possibility of critiquing and changing one's world-picture does not mean that human beings can do so at will or immediately. Neither can one change another person's world-picture purely through rational means. Stressing the inadequacy of using reasons to convince someone to change his worldview, Wittgenstein avers that "[a]t the end of reasons comes *persuasion*" (# 612, italics in the original) – a process akin to conversion where we try "to give him our picture of the world" (# 262). In the process of revising one's world-picture, "[s]ome practices will stay longer than other ones, and a medley-like mixture of discursive language-games constituting a world-picture is a product of a heterogeneous historical development" (Kober, 1996, p. 435). The organic and evolving attribute of world-picture gives rise to multiple world-pictures across sub-communities or sub-cultures within the same locality; they are all united by what Wittgenstein calls "family resemblance." Using the example of members of a family, he explains that "family resemblance" refers to "various resemblances between members of a family: build, features, colour of eyes, gait, temperament, etc. etc. overlap and criss-cross in the same way" (*Philosophical Investigations*, # 67).

A person's world-picture provides the basis for such a person to make sense of and adjudicate between competing beliefs. Theory-ladenness implies that epistemic terms such as knowledge, truth, evidence and rationality are undergirded and framed by one's worldview or "totality of judgements" (# 140). Macmillan (1983) argues, "The picture, then is this: at the beginning there is training and more or less forceful impartation of language and belief; the child is given a nest (OC 225) of convictions which stand fast for him, which make possible the other modes of teaching within which *rationality* is possible" (p. 369, italics added). Strawson (2000) concurs that we cannot help accepting certain beliefs as "defining the areas within which the questions come up of what beliefs we should rationally hold on such-and-such a matter" (pp. 39-40). Wittgenstein's views parallel those of nineteenth century philosopher John Henry Newman (1890) who asserts that all of us are governed by "antecedent assumptions" that stem from and reside in our tradition (Wittgenstein's world-picture) on whose resources we draw. Antecedent assumptions include not only the taken-for-granted theories or systems of thought, but also the accompanying concepts and attitudes, as well as the language in which they are expressed (Mitchell, 1997).

It should be clarified that Wittgenstein's exposition of belief system, in my view, does not necessarily imply or support epistemic relativism: the view that competing claims cannot be resolved from an objective and universally applicable standpoint since notions of truth or rationality are totally determined by an individual's belief system (world-picture). Wittgenstein's point is that one's observations, interpretations and judgements of reality are not 'pure' or immune from one's world-picture. Although one's world-picture supplies the background information and presuppositions for that person's understanding of the world, such an understanding remains open to external evaluation and subsequent revision, to varying degrees and in different ways, based on the interaction between one's theory and observational data.

The interplay of theory and data is amplified in an example given by Wittgenstein on a researcher's investigation of physical objects. Wittgenstein notes that the researcher's knowledge of the dimensions of a bridge depends on both the researcher's calculation (i.e., observational data) as well as the researcher's "assumption or a decision" (# 146) (i.e., theory). It is noteworthy that the dimensions of the bridge are not subjective or biased – they exist in the external world and can be independently verified. However,

the dimensions make sense and are useful only when framed and supported by the investigator's background knowledge and assumptions of the earth and other physical objects. A meaningful calculation of the dimensions of the bridge, for instance, presupposes that an external world exists and that the measurements of physical objects such as the bridge remain fairly unchanged over time. There is therefore a symbiosis of the subjective and objective, with the theory giving meaning to the data and the data confirming the theory. In the event that one's prior theory repeatedly fails to support the data, for example, when a researcher's calculation consistently contradicts that of fellow researchers, the researcher may be compelled to question and revise one's theoretical commitment and other aspects of one's world-picture.

Implications for the Problem of Investigator Bias Using the Example of China

Wittgenstein's concept of world-picture offers us insights into the nature of beliefs in terms of their features, organisation, acquisition and change. A major implication arising from Wittgenstein's work is a need for researchers, especially comparativists to understand their own world-picture as well as the impact of their world-picture on their theoretical framework and presuppositions, analytical tools, research methods and other areas relevant to the research study. Such an endeavour requires deep, honest and critical reflection on the part of the researcher where the person "takes a step back from what he has come to take for granted, he precisely suspends the criteria he normally employs in making a choice" (Bax, 2011, p. 138). A recommended approach is for researchers – individually and/or collectively – to respond to one or more of the following guiding questions (note that the list of questions is not exhaustive):

- Which aspects of my (the researcher's) world-picture (beliefs, values, assumptions, expectations etc.) are relevant to my research topic?
- How would I describe my beliefs in my world-picture: which ones are liable to change and which ones stand unshakably fast?
- How does my world-picture (beliefs, values, assumptions, expectations etc.) impinge upon my theoretical commitments for the research study?
- How does my world-picture (beliefs, values, assumptions, expectations etc.) impinge upon my observations, perceptions and interpretations of data for the research study?
- With respect to my research study, how do I define 'knowledge', 'evidence', 'truth', 'rationality' etc.? How universal, objective and defensible are my interpretations of these epistemic terms?
- How does my understanding of my world-picture (beliefs, values, assumptions, expectations etc.) help me to be aware of theory-ladeness in my research study?
- How would I describe the nature of theory-ladeness in my research study: is it radical/strong, weak or something in between?
- How does my understanding of my world-picture (beliefs, values, assumptions, expectations etc.) help me to avoid or minimise the (potential) effects of investigator bias in my research study?
- How may my research data interact with, influence and challenge the theory I am using for my research study?
- How may any revision to my existing theoretical commitment for this research study impact my world-picture (beliefs, values, assumptions and expectations etc.)?

To illustrate the essence of investigator bias and theory-ladenness as well as an application of the guiding questions to cross-cultural research, the rest of the section turns to research on China as an example. A case in point is the research methodology used by twentieth century American historians to interpret the history of China. Cohen (1984) observes that Western historians have largely adopted the three dominant paradigms of impact/response, modernization, and imperialism to analyze Chinese history in the nineteenth and twentieth centuries. All three paradigms, Cohen maintains, reflect “the political, intellectual, and cultural milieu within which the [American] historian lives and works” and are expectedly “burdened by Western-inspired assumptions about how history *should* go” (p. 5, cited in Hall and Ames, 1995, p. 121, italics in the original). Consequently, these historians’ research approaches “are fundamentally circular in that they end up finding in a vast and complex historical reality precisely what they set out to look for” (ibid.).

Relating the above example to Wittgenstein’s discussion on belief system, the three paradigms are part of the taken-for-granted world-picture held by Western historians. Far from being objective and universal, these paradigms are the cultural products of socialization, enculturation and scholarship for these historians. The paradigms or theories are laden with the researchers’ beliefs, values, assumptions and expectations, which in turn shape their observations, perceptions and interpretation of data for the research in China. As Hall and Ames (1995) put it, “distortions traceable to uncritical universalistic assumptions undermine the value of Western attempts to tell China’s story” (p. 121).

Theory-ladenness in the above fashion is also applicable to research on policy borrowing in China. For the past few decades, China has been borrowing educational thought and practices from elsewhere, especially Anglophone societies. A salient feature of the current education reform in China is the promotion of student-centered learning (Tan, 2013; Tan & Chua, 2015). Such a move reflects an international trend that links student-centered learning to twenty-first century competencies in an era of globalization (Baeten et al., 2010). Despite concerted efforts by the Chinese authority to change the dominant pedagogy from teacher-centeredness to student-centeredness, research shows that the former, far from being jettisoned, continues to be valued by Chinese educators and featured prominently in Chinese classrooms (e.g. see Biggs, 1998; Jin & Cortazzi, 1998; Gu, 2004; Tan, 2015a, 2016a, b).

A researcher whose prior cultural worldview and theoretical presuppositions are critical of didacticism (e.g. equates it with rote-memorization and indoctrination) may view the dominant teacher-centred approach in China as outdated and inferior. Such a judgment echoes the ideologically biased assumptions held by some Western historians about why a phenomenon (in this case, pedagogical reform in China) does or does not go as it should. Alluding to theory-ladenness, Sinologists Hall and Ames (1995) posit,

Perhaps the Chinese do think about, select out, and organize the welter of detail that constitutes their cultural superstructure in ways very different from our own. In order to appreciate an alternative set of cultural dynamics, we must try to get our own world view out of the way (p. 122).

It should be added that the problem of investigator bias is not confined to Western scholars conducting research on China: the same challenge confronts *any* researcher who is oblivious to or complacent about one’s ideological imposition on cross-cultural research.

To address the challenge of investigator bias, the guiding questions mentioned earlier may be useful in directing the researcher's attention to one's own world-picture, prior theoretical commitments and possible ideological biases. Take for instance the guiding question on the relationship between the researcher's world-picture (beliefs, values, assumptions, expectations etc.) and one's research study. A historian who studies the historical development of modernisation in China may, upon self-reflection or consultation with a critical friend, identify elements of her world-picture that are relevant to her research study. Examples are a linear and progressive view of history and a Eurocentric view of modernisation that ties development to liberal ideals and democratic system.

Applying the guiding question on how the researcher's world-picture impinges upon one's theoretical commitments, observations, perceptions and interpretations of data, the historian may realise that her world-picture has contributed to her unquestioning adoption of and allegiance to the paradigms of impact/response, modernization, and imperialism that were used to analyze the history of China. Further relating her world-picture and theoretical commitment to her research process, she may be aware of the real and/or potential effect of investigator bias on her observations, perceptions and interpretation of data, as well as her conclusions and recommendations. An example of investigator bias is an assessment of China's modernization in terms of the extent to which it accepts and borrows 'universal' (read: Western) cultural values, political system and social institutions.

Cognizance of the above would lead the researcher to re-interpret the same set of data, this time using different theoretical lens and presuppositions. A revised interpretation of the evidential data would in turn assist the researcher in reflecting on and modifying, if necessary, her analytical framework and theoretical assumptions on research on China. For example, the researcher may wish to replace/complement her earlier progressive view of history with a cyclical conception of history. She may also re-define 'modernization' from alternative cultural standpoints, one such example being a Chinese perspective that sees progress not in a linear fashion but as a return to an idealized Confucian past.

A scholar who adopts a critical reflective approach to cross-cultural research that is similar to the one recommended in this article is Jacques Gernet. In his book entitled *China and the Christian impact: A conflict of cultures*, he attributes the Chinese's rejection of Western thought transmitted by foreign missionaries not to the dominant Western world-picture of the lack of 'rational thinking' of the Chinese, but to a conflict of cultural worldviews (world-pictures). He problematizes the world-picture of his culture as follows:

Our [Western] own philosophical traditions, which we owe so much to 'the suggestions stemming from certain grammatical functions', are founded upon categories considered to be universal and are concerned with abstractions and ideas that are stable. Chinese thought, in contrast, recognises only functional classifications and oppositions. It is concerned not with 'yes' or 'no', being or non-being, but with contraries which succeed, combine with and complement one another; not with eternal realities but with potentialities and tendencies, phases of flowering or decline, in the place of the idea of law as an immutable rule, it favours that of a model or schema for development (Gernet, 1985, p. 5, cited in Tan, 2016, p. 162).

The dialectics of exploring one's world-picture and its interaction with observational data also applies to research on policy borrowing in China. The self-reflective process involves clarifying and critiquing one's definitions and presuppositions of borrowed ideas and practices in China, in particular learner-centeredness, school choice and neo-liberalism. For instance, a prevailing assumption in the academic and popular discourse is the association of good education with student-centered education and bad education with teacher-centered education (Tan, 2015b). Avoiding investigator bias entails appreciating varied and competing interpretations and presuppositions of good education, teacher-centered education, transmission approach etc. that are generated by different world-pictures across cultures. An example is a Chinese conception of good teaching as 'teacher-directed and student-engaged' where the teacher plays a leading role in transmitting knowledge and promoting active learning in students (Tan, 2015a, b, 2016a).

A fresh perspective and re-interpretation of observational data may guide the researcher to review her theoretical assumptions of and normative judgments on "global signifiers" (Nóvoa & Yariv-Mashal, 2003) such as student-centered education, constructivism, critical thinking and self-directed learning. Far from being standard- and ideology-free, these terms and the policies that support them are theory-laden and engender potential clashes of world-pictures. Cautioning against "the dangers of Western ethnocentrism," Peters (1995) urges scholars to "question the way the modern 'subject of education' has been grounded in a European universalism and rationalism heavily buttressed by highly individualist assumptions inherited from Enlightenment grand narratives" (pp. 203-204). To be sure, the argument that global signifiers are not ideologically-neutral is not new and comparativists have stressed the need to understand local histories, contexts and actors. But the approach recommended in this article goes further by prompting the researcher to explore not only the world-picture(s) of the research subjects but crucially and perhaps more importantly, *one's own*.

Conclusion

This paper has attempted to offer an innovative approach to research in the CIE field by drawing upon philosophical resources. The suggested approach that is developed from Wittgenstein's writings is aligned with a hermeneutic/interpretive perspective that seeks to add to and improve understanding on a given specific phenomenon for study (Crossley, 2009). More, of course, needs to be said about issues relating to investigator bias, theory-ladenness and Wittgenstein's world-picture in the context of CIE. Some topics for future inquiry include exploring various forms of investigator bias in cross-cultural research; the different types, expressions and degrees of theory-ladenness in the conceptual tools and methodologies used in the CIE field; the similarities and differences between world-pictures across cultures; the potential and limitations of critiquing and changing one's theory and world-picture. It is hoped that this essay will alert comparativists to the challenges of investigator bias and theory-ladenness, as well as open up a debate on appropriate responses and innovative methods to address these challenges.

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