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## Special Article

## An Examination of Positivist and Critical Realist Philosophical Approaches to Nursing Research

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### Abstract

This paper emphasises the importance for researchers to explicitly locate their work within a philosophical framework. It examines the ontological, epistemological and methodological similarities and differences of Positivism and Critical Realism; highlighting the strengths and weaknesses of these philosophical approaches in relation to nursing research. Whilst acknowledging several limitations and risks associated with undertaking research from a critical realist perspective it concludes that this perspective still appears to provide a more appropriate foundation for systematic enquiry within the discipline of nursing than is achieved by adopting a positivist approach to such investigation.

**Key words:** Positivism, Critical, Realism, ontology, epistemology, methodology, nursing, research

### Introduction

According to Wainwright (1997, p.1263), '*ontology is what exists, epistemology is how we can come to know about it and methodology is the means of acquiring this knowledge*'. Research questions and the methods employed to answer them should be founded on a specific methodological perspective (Ryan 2018). '*Methodology, in turn, reflects an underlying philosophy comprising an ontological view and associated epistemological assumptions*' and so a key consideration associated with creating and answering research questions is the researcher's philosophical position (Bisman 2010, p.5). To determine whether a philosophical orientation is suitable to address a given research question, one must understand its underpinnings (Schiller 2015) and be able to articulate and justify this approach (Scott 2007). Doing so also allows readers to assess the appropriateness of the selected methodology (Wilson & McCormack 2006).

Positivism and Critical Realism have been identified as two common scientific philosophies (Miller 2010, Ryan 2018). The term positivism was first employed by Auguste Comte, a nineteenth-century French philosopher, to

describe the scientific paradigm, traditionally associated with the study of the natural world, being applied to research in the social world (Cohen, Manion & Morrison 2011). Although positivism was a dominant epistemological paradigm during the twentieth century (Gray 2018) more recently it has been under sustained attack (Patomaki & Wright 2000). Advocates of critical realism, also known as *neomodernism* (Parpio et al 2013), which was developed in the late twentieth century by the British philosophers Roy Bhaskar and Rom Harré (Bergin, Wells & Owen 2008) have contributed to this attack.

During the last four decades critical realism has gained '*prominence as an alternative research framework particularly in the social sciences but also in nursing*' (Terry 2013, p.62). This paper will examine positivism and critical realism in terms of their ontologies, epistemologies and methodologies; evaluating their strengths and weaknesses in relation to nursing research.

### Ontology

Broadly speaking '*the ontological position of positivism is one of realism*' (Scotland 2012, p.10) which suggests that reality is external to the

individual (Gray 2018); hence there is one universal truth (Bisman 2010, Kennedy 2013) that positivists believe is '*not mediated by our senses*' (Scotland 2012, p.10). Positivism is also a form of empiricism (Ryan 2018) which maintains that knowledge is derived from experience of the world (Wikgren 2005). As well as being objective, positivism views reality as relatively constant and quantifiable (Bassegy 2001, Hesse-Biber 2010, Dierontitou 2014), so it is possible to accurately describe, record and causally explain phenomena within both the natural and social worlds (Bisman 2010, McGhee & Grant 2017).

Positivists argue that to enable the facts to speak for themselves requires '*scientific observation (as opposed to philosophical speculation)*' (Gray 2018 p,24) undertaken in a value-free, or neutral, way (Darlaston Jones 2007). Such scientific observation involves the testing of hypotheses related to existing explanations or 'laws', termed *deductivism*, and the gathering of facts that enable new laws to be developed, known as *inductivism* (Bryman 2016). Indeed, the falsification of hypotheses, or the potential for them to be shown to be false (Collier 1994), is deemed a fundamental positivist requirement for the acquisition of a robust scientific knowledge of reality (Bergin, Wells & Owen 2008).

In common with positivism, critical realism '*offers a shared ontology and epistemology for the natural and social sciences*' (Bergin, Wells & Owen 2008, p.169), recognises the existence of a world independent of a researcher's knowledge of it (Smith 2006, Clark, Lissel & Davis 2008, Williams, Rycroft-Malone & Burton 2016) and '*treats science as providing the most secure source of knowledge*' (Hammersley 2002 p.35). In contrast, however, critical realism is '*founded upon a priori or necessary truths about the nature of the world*' (McEvoy & Richards 2006, p.69).

It asserts that the world is '*composed not only of events, states of affairs, experiences, impressions and discourses but also underlying structures, powers and tendencies*' (Patomaki & Wright 2000, p.223), much of which cannot be observed (Wainwright 1997).

Critical realism therefore proposes the existence of two dimensions of knowledge; the intransitive, '*a reality independent of what we think of it*', and

the transitive, or '*our thinking of it*' (Wikgren 2005, p.14). Since it is considered impossible for a researcher to ever entirely apprehend reality (McEvoy & Richards 2006), '*ontology does not depend on epistemology*' (Øgland 2017, p.6) and science must rely on the development of socially produced theories designed to enhance understanding of this intransitive dimension whilst recognising that such theories are potentially fallible and limited (Bergin, Wells & Owen 2008). Moreover, McGhee & Grant (2017, p.848) argue that since '*all human beings gather and understand information through a worldview which includes histories, prospects, narratives, mental models and cultural norms*' it is impossible for social science researchers to ever be neutral and wholly objective and that '*a failure to recognise this results in the ontic fallacy*'.

Bhaskar (2008) develops the notion of transitive and intransitive knowledge by proposing that reality is both differentiated and stratified within three levels. The empirical level includes experienced or observed events, the actual level all events which occur irrespective of whether we experience them, whilst the causal level addresses the powers, structures and mechanisms which generate events, and which may not be open to empirical measurement (Houston 2001). For critical realists, therefore, the fundamental goal of research is not to formulate universal laws but to '*develop deeper levels of explanation and understanding*' (McEvoy & Richards 2006, p.69).

### **Epistemology**

Positivism prioritizes epistemology over ontology; concentrating on establishing what or how social phenomena occur, rather than why (Grix 2002, O'Mahoney & Vincent 2014) and presents research results in a descriptive and factual format (Scotland 2012). This is because the positivist epistemological position is '*based on a belief that causality is directly related to effect*' and that only the observable can legitimately be considered to reflect reality (Williams, Rycroft-Malone & Burton 2016, p.3).

To establish the nature of reality, one must observe and measure the world in an objective and unbiased way; striving to minimise researcher intervention and so eliminate the potentially damaging effect of individual values

and beliefs on the credibility of a study. Indeed, from a positivist perspective, any claims to 'truth' derived from research which fails to employ such an approach are merely speculation and therefore scientifically meaningless (Ryan 2018).

The goal of positivist research is to discover '*absolute knowledge about an objective reality*' (Scotland 2012, p.10) by finding '*regularly occurring events or patterns*' as the basis for predictions (Bergin, Wells & Owen 2008, p.171). Such predictions can then be further tested under closed conditions to isolate causal mechanisms and generate results with universal application; leading to the formulation of scientific laws (Clegg 2005, Gray 2018).

The positivist view is that '*theory does the work of prediction*' (Wikgren 2005, p.14), that all scientific disagreements should logically be resolvable by means of appropriate empirical evidence (Maxwell 1992) and it is this evidence, not human judgement, that should exclusively determine the merits of a theory (Clegg 2005, Clark, MacIntyre & Cruickshank 2007).

The epistemology of critical realism, however, argues that observed phenomena may not reveal the mechanisms which cause them (Wainwright 1997) and that '*the real world operates as a multi-dimensional open system*' (McEvoy & Richards 2006 p.69). Indeed, Bhasker (2008 p.5) condemns the view that '*statements about being can always be transposed into statements about our knowledge of being*' as an '*epistemic fallacy*'. Since '*a plethora of different contexts and mechanisms can affect outcomes*' (Clark, MacIntyre & Cruickshank 2007, p.524) and an individual's understanding and interpretation of the world will always be socially produced and shaped by personal experiences, perceptions and values (Schiller 2015), all knowledge however it is acquired is therefore deemed fallible and so claims associated with any forms of knowledge should always be modest and examined critically (Miller & Tsang 2010).

Within critical realism, the primary aim of research is to understand potential causal mechanisms or structures that lead to observed phenomena (Wand et al 2010, Oltmann & Boughey 2012); hence researchers seek to identify, observe and document '*harmonious patterns and themes, and the consistent*

*correspondence, or lack of correspondence, of these themes with underlying theories*' (Bisman 2010, p.11). A key process within critical realist research is *retroduction*, in which the researcher seeks to establish the most probable explanation to explain the data acquired (Clegg 2001, O'Mahoney & Vincent 2014).

Critical realism also argues that '*there are rational criteria for judging some theories as better and more explanatory than others*' (Wikgren 2005, p.14) and that '*the best explanations are those that are identified as having the greatest explanatory power*' (Parpio 2013, p.491).

Like positivism, critical realism seeks to establish generalisations, but these are based on a probabilistic rather than an absolute truth (Bisman 2010). Furthermore, rather than demonstrating objectivity, researchers are expected to clearly articulate their theoretical position within a field of investigation and must lead the reader towards this position through their logic, referring to the supporting literature; thereby facilitating third-party evaluation of their assertions (Edgley et al 2016).

### Methodology

Positivist methodology seeks to explain relationships between variables (Scotland 2012) and quantitative methods, incorporating standardised measures and statistical techniques (McEvoy & Richards 2006), are deemed most suitable for '*making causal observations about the world because they generate objective statements beyond the subjective bias of individuals*' (Roberts 2014, p.2). Such research follows a linear process (Ross 2005) and since positivists view their methodology as value-neutral, they similarly regard the knowledge generated by their research as objective (Scotland 2012).

Experimental designs are the preferred positivist data collection method (Clark, MacIntyre & Cruickshank 2007, Shajimon & Soon-Chean 2018) and within healthcare the randomised controlled trial is regarded as the *gold standard* (Clegg 2005). Other data collection tools, such as survey questionnaires or observation, may however be used where necessary (Bisman 2010). '*Quality within traditional positivistic research is ensured by rigorous procedures tested for validity, generalisability and*

*reliability*' (Ross 2005, p.75). Despite such rigour, however, Bisman (2010) reports a concerning tendency in such research to dismiss contrary findings as anomalous.

The *systematic review*, a positivist approach (Ryan 2018), '*addresses a specific research question by collecting and summarizing all empirical evidence that fits a set of pre-specified criteria*' (Gray 2018 p.121). In healthcare, it is claimed that use of the systematic review has enabled a transformation from intuitive to evidence-based practice (Evans & Benfield 2001) and is commonly regarded as superior evaluative tool (Hammersley 2001, Ryan 2018). Since the systematic review is weighted in favour of quantitative research (Clegg 2005), it also arguably reinforces '*the idea that qualitative researchers deal with "subjective" issues while "objectivity" is arrived at through quantitative methods*' (Roberts 2014, p.2).

Critical realist methodology also involves the construction of theory but seeks to do so by offering insights into causal mechanisms (Wainwright 1997), testing explanations of underlying structures and mechanisms as well observable relationships between variables (Miller & Tsang 2010). Indeed, causal explanation is regarded as taking precedence over descriptions (Wilson & McCormack 2006) and, based upon explicit evidence and a clear rationale, critical realist researchers take a position within the debate associated with a subject (Edgley et al 2016) and may even make value judgements about the way things should be (Hammersley 2002, O'Mahoney & Vincent 2014).

Within critical realism, the choice of data collection methods should be determined by the nature of the research problem (McEvoy & Richards 2006). Not only are qualitative and quantitative methodologies considered appropriate and intentional sampling desirable but using both methodologies is deemed more likely to provide a richer understanding of the phenomenon being investigated (Miller & Tsang 2010) and provide scope for triangulation of research findings; thereby strengthening the conclusions of the study (Bisman 2010, Williams, Rycroft-Malone & Burton 2016).

Rather than being linear, such research tends to adopt an iterative process (O'Mahoney &

Vincent 2014); hence the destination of the research cannot be known until it is reached (Edgley et al 2016). Research from the critical realism perspective should ultimately seek to implement positive change (Collier 1994) by arriving at '*reasoned conclusions about how organisations and practices should be*' (Edgley et al 2016 p.326).

In contrast to a systematic review, which simply collates the number of 'quality' studies that support or challenge a hypothesis (Clegg 2005), a critical realist review has no rigid structure to determine how the process is undertaken but seeks to capture and organise values, in the form of ideas, theories and logic, into a coherent argument (Edgley et al 2016). More controversially, such reviews aim to make judgements regarding how realistic competing theories may be, attempt to identify the underlying structures, powers, mechanisms and tendencies which may be operating in the field of investigation and identify gaps associated with the interplay of mechanisms and contexts which indicate a need for further study (Clegg 2005, O'Mahoney & Vincent 2014). This is because the fundamental purpose of a critical realist review is to formulate research questions rather than provide answers (Edgley et al 2016).

### **Application to research in nurse education**

Modern nursing practice and therefore nurse education is '*embedded within complex social situations*' (Williams, Rycroft-Malone & Burton 2016, p.1). Critical realism supports an epistemological and methodological approach to examining topics in which a researcher can legitimately capture a diverse range of evidence, provide deep explanations rather than surface descriptions (Wainwright 1997, Shajimon & Soon-Chean 2018) and '*judge the situation under investigation*' (Sayer 1997, p.484). Moreover, it supports the assertion that '*there is not, even in principle, a "God's eye view" that is independent of any particular perspective*' (Maxwell 2011, p.15).

Positivism tends to regard '*qualitative data as "handmaiden" or "second best" to the quantitative data*' (Hesse-Biber 2010 p.457); yet in much nursing research qualitative data may be of greater importance than quantitative data in establishing the intransitive powers, structures and mechanisms which shape human experience.

A positivist approach is therefore often ‘*not a sensible ideal for studying human social life*’ (Hammersley 2001, p.545) given its inability to capture many unobservable and non-measurable concepts (Wilson & McCormack 2006). In contrast, critical realism reconciles the differences between quantitative and qualitative methodologies (Rolfe 2006) and is therefore regarded as superior to positivism within nursing research (Wainwright 1997).

Although the eclectic, values-based approach of critical realism has been condemned by positivists as ‘*advocating subjectivism, irresponsible relativism and lack of standards which work against conducting proper research*’ (Patomaki & Wight 2000, p.213), Bisman (2010) identifies various techniques available to reduce bias, termed critical multiplism, within critical realist research; including implementing different data collection methods, using multiple sources of data and underpinning a study with several theoretical perspectives.

### Conclusion

Whilst positivism and critical realism share some common ontological/ epistemological assumptions and many positivist researchers no longer strictly adhere to traditional positivism (Smith 2006, Øgland 2017), critical realism arguably offers a more appropriate philosophical framework and related methodology to guide many research questions within nursing.

Although relatively new, critical realism is steadily gathering support (Schiller 2016) and ‘*has already been endorsed by a range of disciplines*’ (Williams, Rycroft-Malone & Burton 2016, p.1) due to ‘*its usefulness and philosophical fortitude*’ (Parpio et al 2013, p.419).

Nevertheless, it remains important to recognise criticisms of critical realism, including the lack of detailed guidance on translating this philosophy into applied research methods (Miller & Tsang 2010) and in how to deal with conflicting data encountered within a study (Rolfe 2006).

Hammersley (2009, p.7) argues that ‘*social scientists, whether realists or non-realists, have no distinctive expertise to determine what is good or bad about the situations they seek to describe and explain*’. It is therefore perhaps of utmost importance that any value judgements derived

from research founded on the philosophical principles of critical realism are derived from extensive and varied evidence presented in the form of extremely robust arguments.

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