Critical Realism and Empirical Research Methods in Education
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Abstract

In the light of recent writings of Richard Pring, and in relation to the application of empirical research methods in education, this paper offers a corrective to a neo-realist viewpoint and develops a critical realist perspective. The argument is made that the deployment of empirical research methods needs to be underpinned by a meta-theory embracing epistemological and ontological elements; that this meta-theory does not commit one to the view that absolute knowledge of the social world is possible; and that critical realism is the most appropriate meta-theory to underpin the use of empirical research methods. Further to this, unhelpful dualisms between quantitative and qualitative methodologies, and between structure and agency, are discussed in relation to neo-realist and critical realist perspectives.

> Animals are divided into: (a) belonging to the Emperor, (b) embalmed, (c) tame, (d) sucking pigs, (e) sirens, (f) fabulous, (g) stray dogs, (h) included in the present classification, (i) frenzied, (j) unnumerable, (k) drawn with a very fine camel hair brush, (l) et cetera, (m) having just broken the water pitcher, (n) that from a long way off look like flies.—Jorge-Luis Borges (quoted in Foucault, 1973, p. xv)

Introduction

Richard Pring in his article 'The ''False Dualism'' of Educational Research' (Pring, 2000a) and in his book *The Philosophy of Educational Research* (Pring, 2000b) espouses a form of neo-realism that allows for a reality independent of the viewpoint and stance taken up the observer, has an objective dimension to it, is not constructed in any meaningful sense by the observer, and supports a non-consensual and in part representational view of truth. From this perspective, he offers objections to two familiar research paradigms (naive realism and radical relativism7) and further objections to research methodology being dominated by the false dualism, as he understands it, between these two paradigms. He then develops an alternative position or paradigm that allows him to allocate distinctive roles for qualitative and quantitative methodologies and these are not understood as in any way mutually opposed to each other.

Though Pring's neo-realist position has been the subject of some debate (for example, Frowe, 2001), little has been written about the correctness or otherwise of the relationship that Pring and other neo-realists identify between this meta-theory and the use of empirical research methods in education. I want to suggest that critical realists, as well as sharing with neo-realists a belief in an independent reality, are better able to account for its socially constructed and non-solipsistic dimensions. My argument then is that any reconciliation between qualitative and quantitative methods and methodologies (Pring's second objective) has to take account of the principles enshrined in a critical realist meta-theory. Finally, the central ontological issue of the relationship between individual self-determination and social context (agency and structure) will be addressed in critical realist terms, and the argument will be made that any reconciliations between naive realism and radical relativism, and between qualitative and quantitative methodologies, need to take account of this relation.

Meta-Theory

Since my focus is on the relationship between a critical realist meta-theory and empirical research methods in education, in the first instance this comprises the acceptance of two propositions. The first is that the deployment of empirical research methods requires, or indeed needs to be underpinned by, a meta-theory, such as empiricism, critical realism or pragmatism. The second is that holding a belief that an independent reality exists does not commit the researcher to the view that absolute knowledge of the way it works is possible. Critical realists make the assumption that an ontological theory presupposes an epistemological theory; and further to this, that this meta-theory influences the way data are collected and analysed about the social world (the strategic and method levels).

The first of these propositions, that there is a logical relationship between ontology, epistemology, strategy and method, has been disputed by Bryman amongst others, on the grounds that: 'it fails to recognize that a whole cluster of considerations are likely to impinge on decisions about methods of data collection' (Bryman, 1988, p. 125). Although there are always likely to be practical and ethical constraints on collecting and analysing data, it is not so easy to dispense with philosophical concerns, such as data authenticity or the truthfulness of statements that the researcher makes, and these cannot be subsumed into the practical activity of doing research. For example, a respondent in an interview may or may not give a truthful account of what they are doing; however, the researcher is still concerned with the veracity of the statements made to them and subsequently with the veracity of statements that they themselves might make. To argue against the need to foreground philosophical concerns is to suggest that issues of validity, reliability and truthfulness should not be central to the work of the researcher. Conflicting views of the social world, therefore, have no way of being resolved except through their respective practical applications; and even here philosophical criteria would need to be developed to determine which is most practically applicable. Since the researcher, by definition, engages with the world and provides a description of it, then philosophical issues, even if they are not explicitly acknowledged, underpin the methodological decisions that are made.

The second proposition is that holding a belief that an independent reality exists does not entail the assumption that absolute knowledge of the way it works is possible; a position endorsed by most critical realists (for example, Bhaskar, 1979, 1989). There are a number of alternatives here. The first is that it is possible to determine fixed philosophical first principles that guarantee the certainty of knowledge that is produced; and, since that knowledge is about an extra-linguistic reality, then it is possible to identify with certainty an ontological framework that describes how the world works (i.e. naive realism). The second alternative is to argue that any attempt to determine the nature of the social world is always fallible; but this is not anti-realist in the sense that a world independent of particular human endeavours to describe it does exist (i.e. critical realism). A final position is to argue that, because there is this inevitable transitive dimension to epistemology, it is not sensible or even feasible to say that there is a real world that exists outside of and beyond the current ways that are chosen to describe it (i.e. radical relativism). Having established that the second of these alternatives is realist because it is accepted that there are objects in the world, including social objects, whether the observer or researcher can know them or not (cf. Bhaskar's (1989) transcendental argument8 for an ontology of emergent properties located within an open system), it is also important to make sense of the critical dimension.

Critical realism is critical then, because any attempts at describing and explaining the world are bound to be fallible, and also because those ways of ordering the world, its categorisations and the relationships between them, cannot be justified in any absolute sense, and are always open to critique and their replacement by a different set of categories and relationships. Justin Cruickshank makes this point in the following way: '(c)ritical philosophy is therefore critical because it accepts neither the view that there are fixed philosophical first principles that guarantee epistemic certainty, nor the idea that first-order

activities are self-justifying' (Cruickshank, 2002, p. 54). For Cruikshank, both the justification for a critical realist position and its development depend on what he describes as an internal critique. Since there is this divide between reality and how it can be known, any picture theory to explain the relationship between description and its referents is likely to be inadequate. A picture theory, however, can be replaced with a model of internal critique, so that, within existing frames of reference, current or even past ways of describing the world are shown to be flawed and therefore need to be replaced by alternatives. However, each alternative in turn is subjected to this internal critique, and cannot therefore provide epistemic certainty about the correctness of the ontological framework that is being proposed.

Critical realism then seeks to bridge the divide between the first and last of these positions. Furthermore, it seeks to reconcile the context-bound and emergent descriptions that are made about the world with the ontological dimension that exists outside of, and is independent of, attempts to describe it. Having suggested that the epistemological dimension is transitive, it is also important to acknowledge the emergent dimension of the ontological framework. However, even if the researcher builds in an emergent dimension to their ontological framework, this cannot avoid the epistemological dilemma of whether they can in some absolute sense know it, since any ontological framework *per se*, even if it has an emergent dimension to it, is still subject to the idea that absolute knowledge of anything is not possible. This is also an acknowledgement of fallibility, not in the naive sense that the observer could be wrong about the world because they adopted the wrong approach to its investigation, and thus if they adopted the correct method they could provide an accurate and truthful account of it, but in the sense that they are always one step behind the evolving and emergent nature of the social world, and the looping nature of the relationship between ideation and reality (Hacking, 1999) means that descriptions of the world, because they have the capacity to influence and change that world, may become redundant.

Error is a constant possibility in social and educational research, and this is illustrated by the frequent disagreements between researchers conducting parallel research studies. Error can occur for a number of reasons: the researcher mistakes appearances for reality; the researcher uses inappropriate methods; correlations or associations are conflated with causal relations; resources at the disposal of the researcher do not allow her either to explore the subject matter of the research in any great depth or to triangulate using different methods that strengthen the validity and reliability of the findings; and respondents in interview studies and surveys may not give truthful answers. However, all these forms of error are at least in theory correctable. The identification of such errors, indeed the notion of error itself, implies that a better or more correct way of proceeding is possible. Fallibility, on the other hand, goes beyond the notion of error, and implies that social actors are positioned and, therefore, always observe the world from a fixed place (geographical, cultural and, more importantly, epistemological). There is no outsider perspective that allows the individual access to complete knowledge, including knowledge of how the world works. Frequently these two forms of fallibilism are conflated. However, no assertion is being made here that individuals can describe and thus change the world in any way they want (a solipsistic viewpoint), and this is because what is considered to be at that moment in time the most appropriate way of describing the world constitutes the reality that is external to individuals and to which they have to make reference. This implies that new ways of describing the social world are always operating and replacing old ways, even if those new ways are in a critical relationship to the old.

If this is accepted, then observers and researchers are not entitled to say that there are stable and enduring relationships in society that constitute reality, which is independent of them. They can only say that those relationships are constituted as stable and enduring because of the historical play of signifiers that constitutes their understanding of the social world, which in turn impacts on historically located but evolving human practices; and this applies equally to the methods that they use to examine the nature of that social world. This position is neither solipsistic nor naively realist, but it does acknowledge the time-bound nature of their deliberations about the world. What it also implies is that, as researchers or

observers, they cannot avoid entering into a critical relationship with previous and current ways of describing the world and, since the way they create knowledge is a part of that social world, entering into a relationship with reality itself and possibly changing it (the internal critique). Therefore, essentialising explanations, that is, the production of generalisations that persist across time, are bound to be approximations to existing conditions that currently pertain. Only explanations that acknowledge emergence will suffice, and this also puts at risk the possibility of predictive knowledge (cf. Macintyre, 1981, and his four logical arguments against the possibility of prediction9). The alternative is to acknowledge some universals of coherent thought (cf. Strawson, 1959) that would set limits to those forms of life that individuals are embedded within and to the way those individuals can and do process reality. This solution however, cannot provide us with any certainty about what those universals might be, since it is the universals themselves that are implicated in the process of their own identification.

False Dualisms

Having set out the two main tenets of critical realism, I now want to explore the relationship between the meta-theory and the strategic and methodological decisions that researchers have to make. I want to do this by examining Pring's (2000a) neo-realist position that attempts to reconcile quantitative and qualitative methods, whilst at the same time seeking to preserve the link between a particular meta-theory and the collection/analysis of data about the world.

Pring sets out to critique two well-known paradigms in educational research. The first of these (P_a) is described by Pring as having the following characteristics: it is grounded in an assumption that there is an objective reality driven by immutable laws; the researcher is separate from the focus of their research; what follows from this is a notion of truth as correspondence between the research account and that which is independent of this account in reality; and problem and solution can be generalised from one setting to another. He contrasts this with a second paradigm (P_b) that has the following characteristics. Reality is concept-dependent, and, because people live through this world of ideas, is constructed; *and* there is no way that the person can step outside this world and thus there is no independent (that is, independent of the person's viewpoint) way of checking that those ideas faithfully or otherwise represent reality. Individual human beings communicate by negotiating amongst themselves, and through these processes of negotiation reach a consensus about how they should live; and this is an on-going process as new people with new ideas have to be incorporated into this consensus-building exercise. An idea of truth is possible, and this refers not to a correspondence between ideas and reality but to the nature of the consensus; as a result of this, there is nothing objective in the world, where this refers to that which is independent of this world of ideas; *and* because we cannot talk about a reality that is independent of our conceiving of it, there are therefore, 'as many realities as there are conceptions of it - multiple realities' (Pring, 2000a, p. 253).

A number of arguments are put forward by Pring against radical relativist or constructivist ways of seeing the world (P_b). The first is that any thorough-going relativist approach cannot claim any special status as knowledge because relativists deny the possibility of knowledge being produced about the world that is not relative to historical and social arrangements. This is the familiar self-refuting argument. The second is to deny that reality exists outside of the individual's conception of it is also to deny the existence of other people's conceptions of it, and, therefore, of any possibility of verifying one set of precepts over and above any other. If disputes between people can only be resolved socially and politically, without invoking a truth criterion, then this leaves the most vulnerable even more at risk.

The third argument Pring deploys to counter radical relativism is that because there is an infinite number of ways of classifying and dividing up the world (a position that he accepts), this doesn't imply that the world is in fact divided up in an infinite number of ways. I should add here that Pring is careful to

distance himself from P_a, though he comes close to asserting what he is refuting. Thus, Pring's argument that there is in theory an infinite number of ways by which the world could be divided up is countered by the claim that the social world is not divided up in an infinite number of ways, and this therefore allows him to deny relativism, assert a limited form of objectivity and build in the possibility of a truthful account of that reality emerging. However, and contrary to this, a critical realist, though ready to accept that reality is not constructed in any immediate sense, would argue that it has a history, and it is because of this history that an independent world can be identified. Finally, Pring asserts that even if it is acknowledged that the social world is constructed in some meaningful way, this doesn't imply that all that is left is negotiated meanings, because, for him, negotiated meanings presuppose the existence of things:

These things must have certain distinguishing features that make possible our different constructions of the world. It is always possible to refuse a construction that is imposed upon one, not simply from bloody-mindedness, not simply from lack of interest, but also from the fact that such a construction is not possible - given that reality (physical and personal) is what it is (Pring, 2000a, p. 256).

However, and in opposition to this, a critical realist would argue that social realia, many of these central to educational research, are what they are because of many decisions made in the past and currently being made by human beings living together, and are constructed in this sense. Pring seems to be arguing against this critical realist position when he suggests that the social referent is extra-linguistic and has not been constructed (even in the past) in any sense. He is thus in danger of arguing that language mirrors reality (Frowe's (2001) designative function), though he explicitly rejects this; or of leaving vague the actual form of realism that underpins his thinking. What Pring is doing here is, implicitly and at times explicitly, making a number of conceptual moves to free human beings from a reliance on these two paradigms. He is criticising the tenets of the two paradigms and in effect substituting a third paradigm, which is nevertheless paradigmatic because it seeks to address and provide answers to foundational philosophical questions and because it is incommensurable with other established paradigms.

For Pring, both P_a and P_b are wrong because their constituent features do not adequately describe the nature of knowing (epistemology) and the nature of reality (ontology). Drawing attention to the misconceived nature of each, however, implies that a third position is possible, one moreover that better accounts for the structures of the world and how they can be known. This can be referred to as P_c, and it is possible to describe some of its features: sophisticated realism; epistemological objectivity; the necessity of a notion of truth; and the possibility of both identifying an ontological framework and the means for deciding between different and incommensurable versions of reality. It is therefore possible to develop an epistemological theory, and this is implied by his move from philosophy to methodology when he concludes that certain types of approaches used for researching the social world are feasible, legitimate and appropriate. Qualitative work, for example, 'sets limits and gives greater refinement to the more general verifiable and (where possible) quantifiable claims which research should constantly be seeking' (Pring, 2000a, p. 259). He ends up, therefore, arguing that quantitative work can fulfil certain purposes, i.e. determining the generalisability of objects and examining 'social structures which constrain' (Pring, 2000a, p. 258) agents' activities; and that qualitative work can fulfil other or alternative purposes, i.e. determining agents' unique intentions and beliefs or their 'subjective meanings'10 (*ibid.*). This leaves unanswered the question as to what the relationship between the two purposes is, and unless this issue can be resolved, the researcher or observer is unable to make appropriate methodological decisions.

Though P_b is developed from a particular reading of constructivism, and though he acknowledges that there are other alternatives to radical relativism11, indeed, his own, he still compares one extreme version with another extreme version and is thus quite easily able to describe what emerges as a false dualism. In the end, he is forced into the development of another dualism, which is never fully resolved. Critical realists, on the other hand, attempt a reconciliation by developing a particular understanding of the

agency/structure relation. It may be objected however, that the agency/structure relation is not central to any empirical examination of the social world. Two arguments can serve to counter this. The first is that all empirical research makes ontological assumptions, whether explicitly or not, and thus it is incumbent on the researcher to foreground such issues in order to choose the most appropriate methods for their enquiry. The second is that every social situation available to the researcher for examination embodies assumptions about the ability or otherwise of social agents to act in the world in the context of structural or situational factors or constraints (Cruikshank, 2002).

Agency/Structure Relations

For critical realists then, the central relation of social reality is between agency and structure. Margaret Archer has identified four versions. The first comprises a neglect and marginalisation of agency so that 'structure and agency are conflated because action is treated as fundamentally epiphenomenal' (Archer, 1990, p. 81). The second takes an opposite form so that structure is understood as nothing more than the creation of agency, and thus has no independent powers from those potentially exerted through agency. The third view, developed by Anthony Giddens (1984) as a theory of structuration, ties agency and structure closely together and gives explanatory primacy to neither, because they are mutually constitutive. Archer's fourth view, a morphogenetic/morphostatic position, conceived in opposition to the theory of structuration, argues that agency and structure have distinct properties and powers that cannot be subsumed into the other. Social structures pre-exist agential operations, and in turn human beings reflexively monitor the social world, individually or collectively exerting an influence, and changing relatively enduring but emergent structures.

If Archer's first two types are rejected, then methodological approaches that prioritise either structural or agential perspectives to the exclusion of the other also have to be rejected, and the researcher needs to adopt strategies and methods that allow her to enquire into who is doing what, with whom and for which reasons, in order to arrive at adequate explanations of structural properties (Carter and New, 2004). In a similar fashion, it is not possible to understand agential decisions unless they are contextualised in terms of the constraining and empowering properties of structures. It is therefore not appropriate to argue that investigation of structures lies in the quantitative realm, and investigation of agential activities lies in the qualitative realm, but instead argue that appropriate methodologies need to be developed and used that allow understanding of the relations between the two, and this may involve the rejection of some methodologies because they treat either agency or structure as epiphenomenal.

By way of illustration, I will take the case of quantitative modelling, a highly influential research methodology in the field of education, and show how the principles underpinning critical realism are distorted in both its conceptualisation and application. The argument that will be made is that quantitative modelling comprises the adoption of certain forms of essentialism that misrepresent the emergent nature of the world. Furthermore, the claim that some essentialist explanations may be misleading does not in itself deny that some objects have similar properties, because a further claim is made to the effect that all classes of objects are not alike in every respect, though they may be understood as such (Sayer, 1997). These objections to quantitative modelling can be summarised as: a tendency to essentialise and thus provide misleading descriptions of structural properties, a neglect of ontological and epistemological emergence, and a conflation of intensionality and extensionality, a consequence of which is that social actors' beliefs about themselves and an external reality are treated as epiphenomenal.

Essentialism

Deterministic essentialism may take one of two forms: genetic predisposition and institutional or structural predetermination. Furthermore, a belief in genetic or institutional determinism doesn't imply

that human beings are in a position to predict what will happen. This is because they may not be in possession of adequate knowledge of events and activities in the world. Both forms of determinism deny the possibility of individual self-determination; in the first case human beings are seen as simply the carriers of genes, and in the second place as imprisoned within structures that deny the possibility of thinking or acting outside of these constraints. However, structuralist versions of human life may be understood as retrospective rather than prospective and, therefore, as non-predictive. This points to structures that have determined specific individual behaviours in the past or in effect caused them to happen; that is, x has led in the past to y, and has the potentiality to do the same in the future, given the same set of conditions. However, structuralism is not entirely compelling.

For example, critical realists (cf. Bhaskar, 1979; 1989) would posit the existence of objects in society, which have this potentiality; that is, they have powers or attributes that may not be actualised but are potentially realisable. A distinction is, therefore, drawn between the object with its set of powers to act causally in the world and a set of conditions (configurations of other objects) in a particular relation to them. The object does not act in a deterministic way. Frequently an assumption is made that the observer's correct or incorrect description doesn't influence the structure of either the primary object or the secondary objects or of the relations between them; the particular configuration of objects that causes something to happen, including the creation of new objects or the transformation of old objects. This assumption ignores the 'looping effect' (Hacking, 1999) that is a characteristic of social life, and this may in turn lead to another form of essentialising. Deterministic versions of essentialism are commonplace in educational research, and by eliminating human agency from the equation they in effect misdescribe social life.

A further type of essentialism is reductionist in orientation. Whereas deterministic explanations can be located in the ontological realm, reductionist explanations are located in the epistemological realm, though they may have ontological consequences. Andrew Sayer provides a definition of reductionist essentialism: 'the practice of explaining the behaviour of concrete (that is, many-sided) objects by reducing them wholly to (or reading them off from) just one of their abstract (that is, one-sided) constituents' (Sayer, 2000, p. 89). Quantitative modellers, for example, treat race and ethnic characteristics as variables which determine the whole range of dispositions and practices of the person concerned.

The issue is complicated by the looping nature of the relationship between description and object. Though a reductionist explanation may in itself misrepresent social life, it may in time come to represent it adequately because the categorisation involved has real effects, and individuals then understand themselves and behave in accord with the original reductionist explanation. It is important, however, not to assume that it will change reality. The relationship between the cultural and the structural is dependent on a range of factors, such as the means of dissemination of ideas in society, and the privileged or otherwise status of these ideas. But reductionism comprises in its initial manifestation a misdescription of the social relation that it wishes to explain.

Essentialising fails to distinguish between those properties and attributes that are necessarily attached to individual categories of people and to institutions and those that are only contingently attached, with the one transferred to the other. Necessary attributes of any object are, however, in some sense the product of human invention. This is not to suggest that an individual can create necessity by herself, but it is to suggest that many decisions made by individuals and groups of individuals, stretching back in time and occurring in different places, have led to the attachment of different attributes to specific objects. Attribution of this type is, therefore, historically specific, could have been different, and is as a consequence potentially amendable. Essentialising tendencies have the capacity to fix human life and resist change. They do not in any sense describe the real nature of human beings in any absolute way,

though they may contribute to their social sedimentation. Race has no ontological basis (Carter, 2000), and yet racial classification produces social objects and has social effects. Thus the constructs which particular societies attach to particular practices and behaviours may have real material and causal effects. Some theories of human behaviour, however, have as their foundation the belief that human nature can be understood in essentialist terms. Furthermore, some quantitative epistemologies have at their root these essentialising tendencies.

Emergence

A further objection to quantitative modelling, the neglect of ontological and epistemological emergence, refers to the distinction between closed and open systems (cf. Sayer, 1992, 2000). Closed systems operate in two ways. First, they operate in a consistent manner; that is, there must be no change in the object that is the repository of those causal powers between different cases, and this refers to all the possible cases, now and in the future. Second, the external conditions of the causal mechanism must remain constant to allow the closed system to operate. This implies that when both these conditions hold, a causal relation can be inferred from the production of regularities. Social relations, however, take place in open systems. Here, the two conditions that pertain to closed systems are violated. Objects do not operate in a consistent manner; they change their nature. Furthermore, the external conditions for the exercise of those causal mechanisms change also. Thus, again it is likely that over time and in different places, different and non-equivalent manifestations of those causal powers at work are in operation. The natural sciences operate in general with closed systems, and indeed natural scientists may deliberately create conditions that mirror them, i.e. working in laboratory conditions, where they seek to control those external conditions that may contaminate the workings of the system.

Educational researchers have in general a more difficult task: the objects with which they are dealing (individual behaviour, relations between individuals and structural properties of systems) are more likely to change across time and be different in different settings, and those external conditions, that allow those powers and capabilities to be manifested, do not remain constant. This means that the principle of equivalence that is central to all forms of quantitative modelling is unsustainable. As Sayer (1992, p. 177) argues, 'assumptions of linearity, additivity and of the possibility of discovering practically adequate instrumentalist laws of proportional variation all depend for their success on a particular material property of the objects to which they refer'. Quantitative modelling of educational objects that change across time is only possible if the type of change involved is either purely quantitative or 'reducible to the movement of qualitatively unchanging entities' (*ibid.*). If that change is irreducibly qualitative, then like is not being compared with like and certain forms of quantitative modelling are not appropriate. For most educational processes, the object itself and the conditions for its realisation are subject to qualitative change; and this involves identifying how those objects change.

The key problem then for educational theorists and philosophers is to address the fact that the social world exists separately from the individual and is real, but also to accept that the set of constructs and the relationships between them that are used to describe that world could be different than they are. There are, as Pring (2000a) argues, an infinite number of ways of describing the world. Further to this, the social reality that is being described is in part formed by the types of descriptions that members of a society choose to make about it (cf. Frowe, 2001, though Frowe in turn makes the mistake of equating objective information with information that is constructed independently of the researcher or observer, and then arguing that this lends itself to a quantitative methodology - this is an argument which mistakes a contingent relationship for a necessary one12). Constructs and categories are, therefore, implicated in the nature of that social world. Any descriptions made about the way social life is formed refer to a world that has been constructed in part by other descriptions that have been made of that social world in the past. Furthermore, any statements made, including statements about the relationship between ontology and

epistemology, fall into this category and are, therefore, to some extent relative to previous attempts to make sense of the world.

Intensionality

By expressing intensional dimensions as extensional properties, quantitative modellers may, in addition, neglect the intensional dimension of social life. Natural science models, such as behaviourism, for example, attempt to eliminate any references to beliefs, purpose and meaning. Critical realists, however, foreground social actors' descriptions of their experiences, projects and desires. If such intensional activity is marginalised by quantitative researchers, then this acts to reify social relations.

This, however, doesn't imply that social actors can always provide complete and accurate accounts of their activities, plans, projects and histories. However, critical realists argue that such phenomena are central to any investigation they may undertake. Quantitative modellers are effectively engaged in a process of transforming intensional dimensions of social life into extensional properties. Richard Wilson for example, argues that:

> It is crucially important to note explicitly that use of a mathematical model does not imply that descriptions are untainted by intension. Rather, when we develop and apply such a model we arrange to package intensional idioms in such a way that, for the purposes at hand, we can proceed with formal calculations (Wilson, 1990, pp. 398–9).

Because variables have to be able to be expressed quantitatively, they have to conform to the principle of equivalence. The intensional dimension is, therefore, reduced or packaged so that it can be expressed extensionally. The result is that social actors and the relations between them (the objects of study) are reduced to shadows of their real selves; and the resulting descriptions that are made rarely reflect the richness and depth of human interaction.

Concluding Remarks

Quantitative modelling then has its limitations. It has a tendency to reduce and therefore trivialise both what is complicated and what is perceived to be complicated by participants in a social setting. Thus the picture that is received is both incomplete and in some senses a distortion (lacking wholeness) of the ontic state(s). Furthermore, a distortion also occurs if it turns out that the object of investigation lacks scalable dimensions. Quantitative modelling is so constituted that the associations which it readily generates cannot easily be mapped into causal narratives; though of course all too easily associations and causal relations are conflated. [Empiricists argue for persistent relations as against embedded or generative causality.] Such modelling focuses on the empirical (consisting of experiences) and subsequently neglects the actual (events) and the real (mechanisms). This is why the predictive capacity of longitudinal quantitative research as a confirmatory mechanism seems to be so powerful. Accuracy of representation is operating at the level of experience, rather than at any deeper level. Lastly, an unjustified claim is made that the use of quantitative methods or even qualitative methods or a mixture of the two provides a privileged bridging mechanism between representation (epistemology) and what is being represented (ontology). What I would argue it does is structure representations of the world in a particular way (which in turn, of course, may influence the way the world is structured), and is thus always a function, at least in part, of political, social and ethical arrangements.

The objections made above to certain forms of quantitative modelling are not made from either a naively realist or radical relativist position but from a critical realist perspective. This perspective is subtly different from P_c, which emerged from Pring's (2000a) critique of naive realist and radical relativist

positions. Both a critical realist position and Pring's own perspective accept a number of foundational principles. These are: that philosophical concerns need to be addressed prior to making decisions about strategies and methods; that it is not possible to describe the world in an infinite number of ways because reality acts as a constraint as to how it can be described; that there are objects in the world that exist whether they are known by anyone or not; that there is a need to focus on social practices that are not predetermined by social structures since human beings are knowledgeable agents with powers to make a difference and thus have the capacity to monitor their actions and change the practical setting of action (cf. Giddens, 1984); and finally, that a notion of error is accepted in relation to the possibility of providing a correct view of reality.

Critical realists part company with Pring, however, on a number of matters. They introduce notions of objectivity and truth via the idea of the internal critique, arguing that first-order activities can never be self-justifying, whereas Pring argues for a sophisticated picture theory to explain the relation between description and reality -'the negotiation of meanings presupposes the existence of things (including ''person things'')' (Pring, 2000a, p. 255). Secondly, Pring underplays epistemological and ontological emergence, whereas a critical realist understands these ideas as central to any form of meta-theoretical explanation of the social world. Thirdly, Pring is reluctant to accept notions of epistemological fallibility and transitivity. Finally, Pring creates a new dualism between structure and agency that is never fully resolved but that needs a resolution if the emergent nature of the social world is to be fully grasped. The use of quantitative methods may allow human beings to generalise and, therefore, provide descriptions of structures in social life, but only if they can avoid essentialism, reconnect agency with structure, incorporate a notion of ontological emergence and epistemological transitivity, and not lose explanatory power by conflating intensionality with extensionality. If they are not able to do this, then their use provides incomplete and misleading accounts of social life, that, given the close dialectical relationship between description and practice, acts to reify practice and treat first-order activities concerning the way the world could and should be organised as self-justifying.

Central to Pring's argument is the idea that the divide between qualitative and quantitative approaches to the study of the social world is misleading: the two ends of the spectrum do not represent antinomies, but can and should be functionally separate but paradigmatically unified. I have suggested in this article that Pring provides a solution to one duality but only at the expense of creating another, and thus a resolution to the structure-agency problematic is not forthcoming.

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