Reflections from Research Practice: Realism and its reality, coming to know this, and working out its mechanisms of socio-material change

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Abstract

Scientific and Critical Realism attracts increasing attention as a new paradigm of explanation, for many empirical knowledge disciplines. This new approach to explaining our social and material worlds is underpinned by its 'depth ontology', encompassing the reality of our senses to the more meta-physical.

In this article we introduce and explore this 'depth ontology', through rich illustration of these alternative ideas about reality in context of our everyday and early career research experiences. We explain and clarify the realist compromise - between its positivist and constructivist ancestry. We then trace the flow of these philosophical premises into conceptual variation evident around the realist sense of 'mechanism', in current evaluation research literature.

To further clarify its possible meanings, this synthesis contextualises past and current realist thinking in light of historical ideas of change from Aristotle and Plato, as improvement and degeneration. This article offers a new view on realism and its foundations then, to aid readers' own understandings and explorations of the natural and social reasons for existence and its changes, sitting in the depths of the universe of the realist.

Keywords: realism; ontology; explanation; change

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Introduction

Why do our attempts to change often 'work out' differently, in different circumstances, and for different people?

I became interested this question when I encountered critical realism ideas, in reading a colleague's 'neighbouring PhD thesis' being developed alongside my own work on understanding intersubjective communication failures (**Huang, 2015**). As we continue seeking meaningful changes within ourselves and others, this question reoccurs.

In becoming better practitioners at our craft for example, our attempts to improve might fall short or sometimes succeed. As role models for junior colleagues and the next generation, perhaps demonstration once more of a skill we know all too well, provokes distinctly different ideas of progress in those we mentor. As inventors, our technology and prototypes perhaps succeed, or fails beyond our wildest expectations when they finally see the light of the marketplace. Such experiences often suggest to us that efforts to change the minds of fellow human beings or their actions often do not result in *universal* consequences and outcomes, in seeking to implement such changes.

The question of why attempts to change often works out differently, also concerns the making of large-scale policy to instigate change (an area I'm currently active in as a research fellow) (**Stewart et al., 2022; Huang et al., 2021; Mercer et al., 2021**). A most recent example of this, in the ongoing responses to COVID national policies from citizens across the globe. Clearly, we have not all responded in the same way to policies addressing the pandemic, in the differing circumstances of our lives and positions in society.

Research Aims and General Background

In this article, I'd like to introduce and contextualise some ideas from 'realist' perspectives and categories for making sense of such realities – intended to help us understand and more able to exchange and productively debate around why attempts to change often work out differently (in particular of the social-material kind). To support our projects of explanation, an interpretation is developed in this article: of the realist idea of a 'stratified reality'. We also discuss how we might come to know such a reality, and the mechanisms or efforts of change or change implementation which might exist in this sort of reality. This interpretation of key constructs and ontological premises from a realist theory of reality is developed along *interdisciplinary* rather than *disciplinary* lines here, as a contribution towards a depth ontology *neutral* to received disciplinary-specific wisdom/premises on what knowledge related 'things' exist; Repko and Szostak (**Repko and Szostak, 2017:90-96**) refers to these as

'phenomena': in the sense of those enduring named aspects/things of human existence of core interest to a knowledge discipline). The interrogation of realist perspectives and categories as offered in this article importantly attempts to build a foundation for further reasoning – in integration/validation of some of our everyday and early career research experiences across emerging and established knowledge disciplines; through reconciling key elements from the existing body of sometimes contradictory interpretations of realist evidence and ideas active in the current literature. In presenting this new interpretation of realist perspectives from the past, the ideas offered here do not focus only on those *social* aspects of change (e.g., as in the *social structures* and *interpersonal human agency* central to the framework presented by a *Transformational Model of Social Activity* (**Faulkner & Runde, 2013**)), but seek to encompass *both the social and material realms of empirical observations* within a fresh framework and foundation for conceptualising change.

In doing this, we also engage in the exercise of 'Lockean philosophical ground clearing' for current purposes, in a general spirit similar to that presented in Faulkner and Runde (**Ibid**); a novelty of this article however lies in the synthesis of a new coherent conceptual frame for thinking anew about social-material change as presented below, in integration with reflections from those experiences of the everyday and early career researchers. Instead of trying to extend an existing model of change originally developed for just the social realm… to the world of material and non-material technological objects (as undertaken by (**Ibid**)), established Realist literature, categories, and published perspectives are re-interpreted anew here: in the working definitions offered for interdisciplinary reasoning *integrative* rather than polarising of colleagues' prior answers to questions around ideas and ideals of 'good research'… and the kind of reality(s) and Mechanisms of change 'researchable' and thus accessible to disciplines of science and scholarship. In aspiring to aid development of colleagues' own theories of knowledge (and their accompanying ontologies), I hope that the realist ideas and ideals shared below might stimulate and generate useful thinking in colleagues' own propositions, around ideas of Knowledge and Reality, and those organised, coherent, and systematised explicit-knowledge exchanged around these topics of modern epistemology.

To differentiate what follows from Naïve Realism ideas in existing literature, we adopt the common practice of understanding the ideas reviewed below as related to 'critical realism' or 'scientific realism'. As colleagues tending towards applied forms of shared learning, *scientific* realists have focussed so far on developing methodological ideas directly supportive of actual processes/procedures/methods of science and

scholarship (**Kaidesoja 2013: Chapter 3**), e.g., in search of answers to the '*What works, under what circumstances, and for whom'* question opening this introduction (framing answers for example in terms of syntheses of the context-mechanism-outcome patterns discerned through the method of realist review (**Gielen, 2019**)). The work of *critical* realist colleagues on the other hand, have tended to focus on developing the underlying theory of knowledge and reality (**Bhaskar, 2008**) that might cohere with the realist ideas for applied research methodologies being debated in the literature, that may aid us in making holistic sense of the accomplishments from the empiricism of our *scientific* realism studies. In doing so, critical realist undertake the work of trying to explicitly articulate the *consensual* components of epistemology and ontology shared – across the apparently diverse realities from the heterogeneity of natural and social sciences studies, applications, and applied products and processes (as evident e.g. in the development and tailoring of realist ideas in context of the diverse empirical realities of public health (**Jagosh, 2019**)).

Broadly speaking, both scientific and critical realist colleagues share a concern in the thesis that:

> *Efforts to change the thinking and actions of other human beings often do not have universal consequences and outcomes, across all contexts of such efforts.*

We go into further details regarding the progress of realist colleagues in developing this thesis later on. To add to the *contextualisation* of the interpretation of realist themes offered within this article (within its current literature), let us first revisit Aristotle, to better understand some of the lineage of realist ideas presented later on within his ancient (recorded) Western philosophy: on how and why things are the way they are…

The arguments given in support of the main ideas of this article then proceeds through an explanation of basic premises around the realist idea of a 'stratified reality' (in integration with a knowledge context from ancient Aristotelian philosophy); before diving deeper into 3 key and current realist ideas – in seeking key distinctions between those Contexts, Outcomes and Mechanisms of change.

In the final 2 sections of this article, an interim working answer is developed based on the realist ideas and related evidence reviewed earlier, in response to its opening question around why attempts of change appears to be 'systematically circumstantial' rather than universal, in their empirical effects.

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Aristotle's 4 Causes

As an early Greek thinker, Aristotle is famous for his contributions to recorded Western knowledge. One day he sat down to think really hard about *how and why anything is the way it is* (**Carr, 2021**; **Popper, 1963**; **Van de Ven, 2007**) – including consideration of its 'movement' or in the changes we see in the course of its existence, coming up with the four types of reasoning below:

His 1st type of reasoning starts by trying to consider the whys relating to *changes in the 'basic essence', substances, or materials making up entities.* In light of what we believe today about the more or less stable material and physical essence of the universe (for example as made up from a universal set of elements as identified in the periodic table), changes in its fundamental substances/material features are infrequently expected (at least as part of reductionist explanatory strategies grounded ultimately in knowledge from the material/physical sciences (**Andersen, 2001**)). But if we broaden the idea of 'entity' here, to encompass also to all of the social scientific and humanities research objects we know, then the basic substances from which particular 'entities' are made *can* more readily change (e.g., in expanding a company 'entity' from 4 people/roles, to 20). This first style of explanation from Aristotle is that things like known chemicals and companies are the way they are because *it is 'in their nature/essence/basic makeup'* – offered as a sort of heuristic here for understanding and explaining the entity or research objects of interest. In trying to explain what is observed in terms of its general tendency towards change or stasis for example, is it in the *basic essence* of a company:

> a) to adapt (and compromise?) its basic social mission always to the demands of its competitive environments?

> b) or instead to sometimes also maintain and advocate for some anachronistic *things* (e.g., 'listed buildings' in a UK context), or *human attributes* or *values* seen by their curators as of long-term strategic value for what it means, or should mean to be a human being? (as seen in moral or ethics education programmes.)

Aristotle's 2nd type of reasoning for the how and why of things, draw attention to the *particular patterning or (re)configurations* of the basic substances or 'essence' making up entities. Continuing with our example of a company for example, and its assumed basic essence/tendency towards change, perhaps a re-configuration of its existing personnel, departments, procedures, etc. (without adding or taking away altogether any of these basic substance making up a business entity) leads to a more *efficient* company as a result, in other words resulting in a new patterning or form. The company is *now efficient*, because its basic nature has been

reconfigured as part of its inclinations in changing and adapting to its environment; Some chemical compounds are the way they are for example, because of those chemical reactions leading to this current configuration of chemical elements as observed.

Figure 1: An illustrative example of 'causal force'

free tuition (reason) → causes → parents to send their children to school (the change)
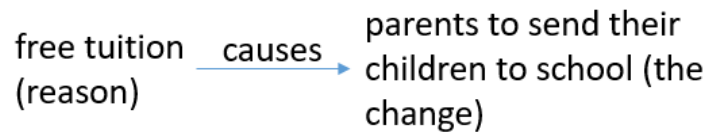
The 3rd type focuses our attention then, on the idea of some *'causal force' or causal relationship* ('causes' in Figure 1), between:

- entities different from the one being affected (e.g., 'free tuition' in Figure 1), and

- the entity changed (e.g., 'parental motivation to send their children to school' in Figure 1); as a result of its interaction, with the supposed 'cause' of its 'movements' or changes (free tuition causing variations in motivation here).

Good experimental research design can be seen as a modern incarnation of this Aristotelian interest in figuring out the 'causal forces between entities', helping us to rule out as many alternative 'counterfactual causes' or confounders we might think of to contradict the causal relationship proposed, through implementing its well-known features (e.g., through the mathematisation of phenomena typically copresent in this type of research study). Notably, ideas of movement or change can in general refer to both documentable *variations in quantity*; or in the narrative description of *key events, activities, or choices* affecting the developmental processes and biography of an entity ((**Van de Ven, 2007**), e.g., as illustrated by some of the formative psychosocial or physical events for a child as they mature and develop into an adult – arguably then leading to change in their form/basic patterning, and perhaps also in their 'basic essence'). It is only with this 3rd type of reasoning, that Aristotle becomes concerned with those *interactions* between 2 or more entities in the world. For example, a merger between two departments (the 2 entities) leading to changes in both departments' 'basic essence' (Aristotle's 1st type around 'essences') and forms of human resources organisation (Aristotle's 2nd type around 'forms').

The 4th and final type of reasoning for the how and why of things, relates to Aristotle's belief *in the existence of an 'ultimate purpose' (in the universe, in life, etc.) for every entity in life.* This relates to his general ideas about the 'Telos' of a person or thing – in contemporary language referring

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to the full potential or inherent purpose or objective of a person or thing (**Wikipedia contributors, 2021**). In context of human development we might for example share the belief of thinkers like Maslow, Montessori and Burchard – in arguing that our daily purposes ultimately orient us in seeking the power to manifest and live out our grand freedoms - in those aspired to in relation to our choices in social participation, emotions, creativity, finances, time, and spirit (**Burchard, 2014**) – to achieve a sense of actualisation of our full material, social, and spiritual potential (**Montessori, 1989; Maslow, 1943**). In living and working practically with the Key Performance Indicators defining our working lives sometimes then, to try to avoid the 'pulling force' exerted sometimes by such measures – in causing our behaviours and interpersonal interactions to drift away from the original goals we set out to achieve in service of others before the KPI came along (**Vanlommel**; **Grøn et al., 2020**)). More prosaically, a teleological cause or ultimate existential purpose might be designed into the design specification for a technological entity we engineer, or seen in the somewhat explicit (self)justifications expected for an academic paper's existence for example.

In summary then, Aristotle starts us off on the search for the how and why of things, by offering the following premises for explanatory elaboration, where a thing is the way it is:

1.   because what we see is part of the basic essence or nature of the thing we see (often known as his 'material cause' in the literature – in a Platonic context of knowledge such 'basic essence' referring e.g., to the basic tendency of things to change in the physical realm, or remain in a state of 'beyond physical' perfection… beyond our senses as developed through the empiricism of day-to-day existence),

2.   because of the form or changes in the form of the thing (often referred to as the 'formal cause')

3.   because the thing has interacted causally with other things resulting in what we see (often known as 'efficient cause')

4.   because what we see is an expression or manifestation of the thing's ultimate destiny, purpose, etc. in its existence (often known as 'final cause', e.g., in 'finding your true purpose').

In this context then, our opening question of why attempts to change often works out differently presupposes *interactions* between the outcomes, context, and the people or things involved in change; therefore taking us down the path of considering Aristotle's 'efficient causes' in context of the Outcome-Context-Mechanism triad basic to many realist ways of thinking. This triad is typically abbreviated as 'CMOs' in the realist literature.

To aid more satisfactory understanding of the sort of reality in which such CMO things could exist, let us first sketch out some of the connections between Aristotelian and Critical Realist view on causation, and then introduce the reality which can be known particularly in the world of critical realism.

These historical connections between (critical) realism and the ideas of Aristotle is important to make, as Aristotle (unlike his teacher Plato) was very keen to build bridges and establish links between the (empiricist) world of the 5 senses, and the higher-order forms of intellectual organisation and reasoning grounded in these 'sense data' (**Rudolph, 2017**) (with these diverse organisations and forms of reasoning regularly observed, e.g., in the concrete sharing of academic reference works, of knowledge made manifest). The 4 types of reasons we just reviewed for how and why anything is the way it is, was one of the key vehicles through which Aristotle's pursued this passion for integration in the empirical and more philosophical… in his time, for understanding the connections between the sensorial and the meta-physical. In our present moment, Aristotle's proposal to understand the how and whys of life through articulating the patterns of *interactions* between entities (the 'efficient cause' approach), is taken forward in Critical Realists' view for the idea of causality not as a matter of 'the feeling of expectation that we have upon encountering the first item of a regularly ordered sequence' (a Humean theory of reality), but as a matter of 'the exercise or display of things' powers' (**Groff, 2009**). Aristotle's 4 causes as presented here then, helps us in tracing back along past connections and lineage in the history of ideas around *causality*, at the same time serving also as wider context for our own works on ideas of causality, causal interactions, and causal intervention (e.g., aided by explicitly articulated conceptual frameworks to support 'complex intervention' projects in context of recent developments in medical knowledge (**Skivington et al., 2021**)). Specifically, contemporary viewpoints allied to realist perspectives provide significant justification, for the idea that *causality itself is an idea belonging at least in part with the sensorial rather than meta-physical realm, as a 'basic organising feature' of our sensorial realities in fact* (**Lakoff, 2008**; **Pearl, 2018**) when the links between human thought and language are carefully studied and reflected upon.

Further in depth exploration of Aristotelian and Critical Realist theories of causation are not taken up here; as an extended discussion on this related complex topic, would take us far afield from the present focus on developing a new interdisciplinary foundation for interpreting the realist idea of 'stratified reality', and those mechanisms of socio-material change within this sort of reality. The brief explanation above hopefully serves to whet the appetite of readers to explore further themselves however, as a

point of departure for making their own independent connections between Realist and Aristotelian thought, in researching further the matter of causation in realist theories of reality.

The 'Stratified Reality' of a Critical/Scientific Realist Approach

In learning about our reality then, a trade-off is often made between the internal and external validity of the main conclusions we draw. In thinking about research and learning in its experimental, quasi-experimental, and naturalistic branches, another trade-off is between the more predefined (quantitative) or evolutionary (qualitative) ideas we share. For critical or scientific realism, its ideas have been mostly developed with an emphasis on accounting for 'in vivo' studies with research subjects living more or less in their usual contexts of existence (e.g., **Westhorp, 2014**; **Spacey et al., 2020**) – in this way improving the external validity/applicability of the main things we learn, in context of empirical settings for the most part under the direction of study participants' own biographical flow of key *events, activities, or choices* (**Patton, 2004**).

Based on a large body of philosophy, theory, and empirical work, critical and scientific realist approaches usually share the assumption of the 'given reality' below, in which a knower compromise between:

1. the idea that we constrain our collective knowledge to only directly observable matters of significance in the real world, and derive unequivocal 'facts' about the world, and

2. the idea that since all our observations of the 'real world' are shaped and filtered through human senses and human brains (as acting and reasoning subjects in our life-worlds, accessed e.g., through sociolinguistics studies), it is impossible to be individually or collectively certain about the basic nature of our reality(s).

The first idea often assumed in positivist philosophies of science, and related applied studies. The second stands in significant dissonance to the first – and is often assumed in constructivist philosophies regarding the idea of knowledge. In framing these ongoing, active, and sometimes implicit arguments around proper definitions of 'Knowledge', and what counts or matters for its ideals, the idea of 'compromise' is used here to refer to the *informed concessions* made by sides engaged in scholarly argument over 'Knowledge', and not intended to imply 'academic weakness' of any of the sides taken in developing reasonable alternatives to foundational ideas around Knowledge(s), Reality(s), etc. In other words, to *accommodate for* here, rather than further polarize colleagues' existing views, arguments, and premises (e.g., in context of ongoing competition between positivist and interpretivist ideals-of-Knowledge in qualitative research (**Wiltshire & Ronkainen 2021**)), when trying to think more

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thoroughly around the researchers' dilemma we've all sometimes faced: over whether to conceive of our objects of learning and practice:

1. as part of *objective Nature* (in their 'basic essence' - reminiscent of the Platonic ideal of 'standing apart' from those objects and ideas under study), or

2. instead as entities residing in domains of change more susceptible to *natural* human influences/practices/biases both in and outside of research communities.

Critical or scientific realism theories of knowledge try to incorporate the best of both of these competing concerns, from its positivist and constructivist cousins. From positivist philosophies, realists take forward the idea that 'reality' *is capturable* through our everyday or enhanced sensory experiences, but rejects the idea that these 'directly-observed sense data' are the only things or matters of significance in reasoning about the world. Additionally, being much more open to the (constructivist) idea that *facts are rarely unequivocal in fact*, in the life-worlds of working academics and scientists for example (**Leng & Leng, 2020**).

From its constructivist cousins, realists accept the fact of scientific knowledge in reality, being produced through the work of quite real, and quite fallible, human senses and brains (including in this fact both the work of expertise, as well as the material or technologically enhanced sensory apparatus involved in knowing). Resulting, e.g., in the critical realist recognition of the approximate and perhaps downright wrong or unreasonably dismissive nature sometime, of our data, analyses, syntheses, etc. and ultimately of our collective knowledge – in relation to an *underlying* realm of existence beyond what we can current sense and know. But in rejection of a nihilist vision in our shared understanding, realists take forward the idea that 'reality' itself constrains the range of reasonable and 'thought through' interpretations we may make (despite the more or less equivocal nature of 'facts' by which we live and understand our experiences).

The idea of a 'stratified reality' in critical or scientific realism work then, tries to schematically capture these compromises, by arguing for us to think about our realities in terms of 3 distinct domains or realms – of the *Empirical*, *Actual*, and *Real*. To avoid confusion, I will capitalise these 3 terms when used in their realist senses from here onwards, in the rest of this article. The interpretation offered below, of realist ontological premises around a stratified rather than 'flat' reality, aims to support a relatively discipline-agnostic foundation for interdisciplinary reasoning. The idea of *stratification* here emphasises a relationship of *underlying*

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layers between each of the 3 planes of realist reality as presented below (coherent with Jagosh 2019's (**Jagosh, 2019**) iceberg metaphor of these planes and the idea that the '*natural sciences progress epistemically by digging deeper into the stratified structure of the world*' (**Kaidesoja, 2013: Chapter 3**). This can be contrasted with the thought of seeing the relationships between these planes of reality in terms of *superset/subset relationships* instead (in the mathematical sense, e.g., in the Empirical being a subset of the Actual as part of an ontology that is 'flat' in essence); as offered sometimes in natural scientific readings of realist premises about the nature of reality (**Mingers & Standing, 2017**) – tending towards avoiding contradiction with the thesis of reality as consisting just of 1 plane of existence).

Empirical, Actual and Real Planes of Reality: And related ontological and wider issues

Figure 2: Realist 'depth ontology/stratified reality' assumptions
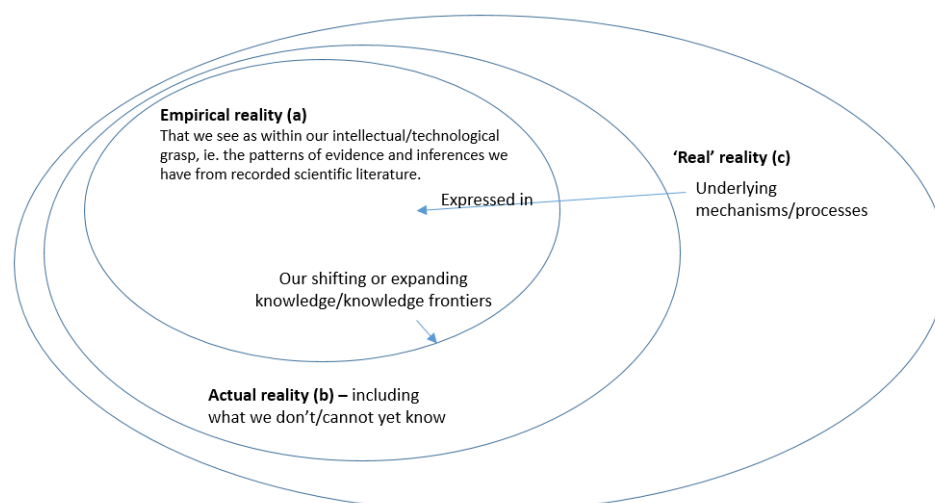
In the empirical domain of existence, we have the familiar world of sensory experience. In terms of scientific research, these experiences result in the qualitatively or quantitatively recorded reductions and 'data' of our lived experiences (**Bernard et al., 2017**); which then are for example displayed, condensed, and evolve e.g., into the main conclusions drawn and verified from a study (**Miles et al., 2013**). This way of defining the *Empirical (a)* covers the 'direct reality' which Naïve Realists try to accurately observe, but leaves out the realist belief in the *eminently fallible* nature of what we think we know – in another words, leaving out the existence of the 'unknown unknowns' accompanying our intuitions in our accounts of the nature of shared knowledge about reality. Our imperfect knowledge of this direct reality will of course shift, contract, or expand over time, and therefore have a changing relationship to the boundaries of the *Actual*.

Some of these 'unknown unknowns' of existence then, were thought originally to exist in the so called *Actual (b)* Realm (**Pawson &Tilley 1997**). Reflecting the idea that even though we already know much about our natural, social, and human worlds as educated lay citizens, *actually* – there is probably lots more to be known! (e.g., through additional training and enculturation in the more abstract 'actual reality' of specific knowledge disciplines). Linking to modest rather than boastful narratives of science, knowledge, etc. from empiricist sources, some realists see their *Empirical* realm as a part of, or as only being the site for surface manifestations of entities in the *Actual* realm – here in part as a sort of placeholder for those 'unknown unknowns' arguably not yet within our intellectual or technological grasp. These could be because we are simply not aware of these (e.g., what we don't happen to know during one lifetime), or due to more fundamental limitations in our collective knowledge (what we cannot yet know given the current progression of civilization).

Finally, we come to the deepest layer of reality, in this 'depth ontology' of Realism. Underlying mechanisms or processes are the entities believed by some to reside in this *Real (c)* domain (**Jagosh, 2019**; **Jagosh, 2020**). As originally conceived (**Pawson & Tilley, 1997**; **Bhaskar, 2008**), the partial *expression* of these forms or ideas (rather than their existence, in a broadly Platonic sense) is that which is captured through our existing data, understandings, explanations, predictions, etc. in or of the *Empirical* domain. With the individual or collective future possibilities in enriching our current intellectual and technological capabilities represented by the domain of the *Actual*. These underlying mechanisms and processes then, give rise to our current patterns and bodies of empirical evidence, and the deductive, inductive, abductive, and retroductive scientific inferences we inherit or work with anew, in context of the new research and knowledge projects we take on. For some, applied realist projects should really engage in retroductive styles of reasoning, in seeking to *go back from, below, or behind observed 'surface' patterns or regularities to explain what produces them* (**Blaikie, 2004**); as supported by methods of Latent Thematic Analyses (**Braun et al., 2018**) or Latent Variable modelling (**Bratianu et al., 2020**) for example.

This depth ontology is acknowledged to have originated in Bhaskar's contributions to first the philosophy of natural sciences (**Bhaskar, 2008**) as part of a wider movement critiquing the analytic philosophies which were mainstream in the latter half of the 20th century (**Kaidesoja, 2013**); since then extended to the philosophies and research practices of the social sciences (**Brönnimann, 2022**).

For those from empirical knowledge disciplines that maintain the distinction between the idea of *understanding* and the idea of *explanation*,

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one might choose to see realist approaches as offering an 'ontology-led *grand* theory': pre-defining an overarching suite of key abstract ideas through which 'reality' and its key entities might be *described and thus made understandable in a collective sense* (i.e., the Contexts, Outcomes, and Mechanisms of change which we go on to review later on). In our individual and collective search for understanding of the world we can see and document, such 'grand' ideas for description are usually without 'specific rules that can be applied to particular situations' (**Davidoff et al., 2015**; **Schon, 2017**) (e.g., think of the status of the idea of a mathematical variable as it first exists in the mind, before a 'rule' given for its operationalisation within some process of measurement); such key abstract ideas for describing the world of the realist functions here more like 'sensitising' rather than 'definitive' concepts in the sense of Blumer (**Blumer, 1954**; **Bowen, 2006**), which *sensitise* those users/learners looking to 'apply' these ideas with only a general and loose sense of reference, guidance, and suggestive directions along which to look for empirical instances (of ideas of *similarity* and *difference* for example in qualitative research data coding contexts); notably without *prescribing* very stringently/a priori those constructs, categories, and relationships between these… which may be observed (e.g., as *is done* in the range of categorical through to ratio scale based data and data structures typically utilised in learning aided by quantification processes (**Stevens, 1946**)). In discussing the sort of 'grand' theory of reality (**Davidoff et al., 2015**) supplied by a realist *'language from which to construct particular descriptions and themes'*, as well as ideas for defining variables perhaps, such discussions around clarifying or negotiating the theory of knowledge present in a collaborative project can of course reveal assumptions and world-views that would otherwise remain under-articulated or internally contradictory (**Davidoff et al., 2015**) – and thus sometimes impede the true interdisciplinary collaboration relating to acts and experiences of truly 'thinking together academically'.

A key ontological point from both the earlier and more recent works of Bhaskar (**Bhaskar, 2008**; **Bhaskar et al., 2017**), is that *structured entities* (e.g., chemical substances, scientific theories, people, etc) *possess causal powers by which they can (sometimes) generate those effects observable in the Empirical (and sometimes don't too!)*. This is a key premise agreeable to many realists, regardless of their differences regarding the plane of reality (Empirical, Actual, or Real) in or across which these 'causally efficacious' interactions between entities occurs. When viewed as a structured thing with such causal power, *theories* for example have the power to generate change in the Empirical plane of existence, as we perhaps change our minds in interaction with their main ideas; e.g. in the power of existing scientific or scholarly theory to shape the study and life-

course of 'open systems' as they (co)evolve alongside the conduct of naturalistic research studies, or in implementing main ideas from some theory in context of 'testing' in context of the 'closed systems' defined by laboratory protocols as below:

> 'At the stage of *identification*, it may (or may not) be possible to refine one's perceptual instruments to observe the structure or mechanism and to carry out experiments and test hypotheses in closed-system laboratory-style contexts. However, sometimes the structure or mechanism can only be detected through its effects (i.e., it cannot be directly measured). We can nevertheless "test" our theory by checking that it explains even small characteristics of the issue at hand, by evaluating interventions suggested by the knowledge (do they result in expected outcomes, and if not, is this explainable due to open-system mediations or is there a problem with our theory?), and by looking for other instances where our theory might apply, to ascertain whether it can explain these instances too. At this (usually) inter-subjective fourth level [of *identifying* structures or mechanisms], a new level of reality has been described. It is now possible to begin a new round of the scientific dialectic. Therefore, at this new second level of reality, one can *retroduct* the generative mechanism responsible for it [the pattern of events in or outside of the laboratory], leading to a plurality of possible explanations, the best of which is chosen through *elimination*, followed by *identification*, and so on. Nevertheless, during the process of *identification*, it may become necessary to refine the concepts of the previous levels.'

(a quote from Bhaskar's *Description*, *Retroduction*, *Elimination*, *Identification*, and *Correction* model of the development of scientific explanations in and outside of the laboratory (**Bhaskar et al., 2017: 30**); italics in quotes mine to show these key terms of Bhaskar's model in the quote)

A notable premise from another one of Bhaskar's earlier work in the latter half of the 20th century is in arguing that both the natural and social sciences study *intransitive* objects (**Bhaskar, 2014**) (along the lines of Platonic 'eternal forms' compared to which all tangible forms in the Empirical are but degenerate/imperfect children); but the specific *methods* and *objects of study* of the natural and social realms (in the Empirical or Actual) may differ. Highlighting the fact that human beings:

- are and do form conceptions of their own doings,

- as well as conceptions of the environments and circumstances in which they find themselves (unlike those inorganic objects of

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natural scientific study insensitive to whether they are in laboratory or naturalistic settings).

Since social scientific objects of study (e.g., ourselves and the social institutions we build) are often beings and entities possessed of *reflexivity*, their reflexive conceptions (of what they've done and think about their existence) often in practice play a significant part in *constituting* the key phenomena of interest in the social realm. Social scientists (and learners of social phenomena) are therefore in the notable position of being *'a part of their field of inquiry'* (**Kaidesoja, 2013**), rather than *a-part* from their objects of investigation and the empirical content of the explanatory theories developed (rhetoric for or against these ideas aside!).

In context of human-in-the-loop systems, mechanisms, changes, etc. (as opposed to those entities we observe with less meaningful human involvement in the course of their existence), realists generally answer a modest *yes* to the perennial philosophical question around *whether human beings have freewill* – but only to the extent that the 'resources and reasoning' brought to bear in social contexts of our existence (**Westhorp, 2014**) enables or circumscribe those actions we consider or enact (**Mukumbang et al., 2020**). In another words, many identifiable/discernible mental and physical phenomena are *born only through human agency in thought and action* (e.g., taking a measurement of something, organising a conference, or collaborating on a new research project), and may not otherwise exist at all without our wilful action or 'intervention' on the reality which currently exists in the present moment or era. These 'open systems' governing much of everyday life then, are regarded by many critical realists as a context of manifestation in which the effects of specific mechanisms or efforts of change/change implementation are usually 'buried under numerous other mechanisms that jointly produce the actual events…' (**Kaidesoja, 2013**), as the 'actual events' documentable in the form of the events of the Empirical plane. In these contexts (e.g., in studying ongoing transformations in primary care (**Stewart et al., 2022**; **Huang et al., 2021**)), convergence on identifying the effects of change/change implementation may still be obtained through *investigator triangulation* or *data triangulation* for example.

Back to Aristotle then…

In context of Aristotle's 'material causes' for how and why things are the way they are then, the world of the Realist can also be seen to be made up from a more or less universal set of 'basic essences'. In the interpretation of realist premises offered so far, these 'basic essences' subject to Realist forms of explanation, would be the *mechanisms/processes* whose full essence lies outside of our current collective knowledge (**Jagosh, 2019**; **Pawson and Tilley, 1997**).

The structures we see the universe to be made of currently then, are for some Realists referring to how its particular underlying mechanisms or processes are (re)configured and expressed in Empirical and Actual reality - at any point in time. In this way also bringing into the discussion the Aristotelian sense of 'formal cause'. As with Aristotle, the basic essences of 'reality' (of the 'mechanisms/processes') are assumed to change perhaps infrequently for some, with their observable forms changing more frequently in their manifestations in the Empirical and Actual domains. The 'causal forces' and relationships we might document then (along the lines of Aristotle's 'efficient cause'), are no longer seen as located and existing solely in Empirical reality! This fits well with our intuition that 'causes' as relationships to be evidenced (rather than referring to things doing the causing), are rarely able to be tied directly and unambiguously to a specific 'event based' empirical data point or observation in practice. These 'efficient' causal relationships we document then (Aristotle's 3rd type), are in realist terms but one of many possible tangible expressions through which underlying mechanisms or processes may make their presence known and manifest in the Empirical or Actual.

In essence, this aspect of Realism challenges even the results from gold standard clinical trials - in making the point that their results (about causal effectiveness, causal efficacy, etc) reflect only a *part of*, all the possible expressions of underlying mechanisms or processes residing in the Real domain.

In terms of Aristotle's ideas about the existence of an 'ultimate cause' (Aristotle's 4th type), to explain the 'life purposes' of each of the animate and inanimate things in a world - Realists might argue that perhaps these sit in the depths of the Real, as ultimate mechanisms and processes driving our everyday (inter)personal and (inter)professional existence (Pawson and Tilley, 1997). The more or less visible changes we actually encounter in each of our Empirical realities then, are but the visible tracks which Aristotle's 'ultimate purposes' leave in our individual and collective biographies.

Contexts, Outcomes and Mechanisms of Change in Realism

Back in the world of the Realist then, one reads regularly about configurations of *Contexts*, *Mechanisms*, and *Outcomes* in its literature. These basic realist ideas can be seen as 3 alternative starting points in realist ways of knowing, as an alternative or complement to the key idea of *case* in considering units of analysis in qualitative research for example, or the idea of *variable* based units of observation in working with quantified research objects or subjects. We will start by introducing realist ideas of Context and Outcome, and then return to its far more complicated and equivocal idea of a Mechanism.

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Contexts of Change, and Arguments Over the Place of 'Activation of Causal Powers of Entities' in Sciences of Causal Inference

When underlying social and material Mechanisms (culture, policies, programmes, etc) are brought into some kind of relationship with other entities in our Empirical world, it is always under particular circumstances, contexts, and historical or current conditions. These particularities are for realists a sort of social-material substrate which has shape the existence and lives of the Empirical entities studied. In conducting realist research, ongoing changes in these surrounding circumstances and conditions sometimes enable the activation of previously dormant 'causal powers', of a Mechanism. As google scholar recently reminded me for example, changes in the surrounding circumstances is the only constant, in our lives as 'researcher entities'. 'Entities' in general may have their dormant causal powers *activated* (and observed as e.g., human tendencies), due to changes expected or unexpected in their current conditions of existence (**Mingers & Standing, 2017**).

This idea that causal powers as possessed by entities, are circumstantially rather than universally active/activated, can also be discerned in discussions of the 'exercise' (**Kaidesoja, 2007**), 'triggering' (**Taylor, 2021**), or 'manifestation' (**Lassiter & Vukov, 2021**) of the potential for, and potential to change represented by these supposed 'powers'. In another words foregrounding the *emergent*, *local* nature of achievements of human will as generated *in context* of its social-material circumstances of existence (as Situated Action theorists also do for example, according to Feldman et al. (**Feldman et al., 2021**); as opposed to e.g. theories of rational choice tending towards context-insensitive abstract representations of human actions (e.g., in context of marketization of sites and circumstances of human learning (**Livock, 2018**)):

> *It [rational choice theories] also neglects the fact that the various causal capacities that human agents have become activated by depend on the social and historical context and on the principles and norms that human agents internalize because of the context they are situated in.* (**Herfeld, 2022: 14**)

Whether these causal powers are to be thought of as meta-physical entities located in the realm of the Real, or exist instead as part of documentable *features* of Empirical entities susceptible to being explicitly shown to exist in the Empirical or Actual (e.g., through quantification and its associated technological means) – remains as yet ambiguous and an active area of divergence, difference, and realist debate (**Kaidesoja, 2013**: **60**). In contradiction to Hume's regularity theory of causation (which grants the privilege of 'existence' (in scientific or scholarly communication contexts at least) only to those notable events of change or difference

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graspable within the Empirical (**Maxwell, 2012**) and perhaps also those within the Actual), critical realism's revival of the idea of *unobservable/unobserved* entities (e.g., Mechanisms existing in Actual or Real reality) giving rise to an *observed* action, phenomenon, or condition – can be a problematic premise to accept for some colleagues and knowledge disciplines. In another words, for some realists (**Ibid**) the *ideas*, *meanings*, and *beliefs* which sit beyond the physical realm (about 'free tuition' as anticipated with school A rather than B say) is generally believed to really have 'causal force' (in the Aristotelian sense, e.g. parental motivation), in shaping or changing the biographies or existence of other entities (such motivation then causing children to be sent to particular schools based on anticipation rather than actual parental experience or direct observations). In this line of thinking, these 'feeling[s] of expectation' (**Groff, 2009**), in response to the already ordered structures of sequences of quantified observations presented on schooling for example, are regarded by some realists as *perfectly valid (abstract) objects of study for current scholarship, or in the current sciences*.

Outcomes of Change

To realists, outcomes document change (e.g., from doing an evaluation of what impact a programme or policy had). But these changes in outcomes are only the start, rather than end in our understanding of *why* they occurred as documented. Realists argue that we need to understand how Mechanisms and Empirical Contexts interacted too, to produce the documented change in outcomes (as best as we can in light of our imperfect Empirical knowledge of the Mechanism in question). A common realist premise is also in the point that the causal impact of a Mechanism (in context) may or may not be not readily observable in changes in key Empirical outcomes, depending on the state of influence(s) from other Mechanisms also active and/or countervailing at the same time or place as these 'activated causal powers' (**Mingers & Standing, 2017**).

Mechanisms

Developing Aristotle's idea of a 'causal force' (his 'efficient cause'), into the more elaborate realist idea of 'causal powers' of a Mechanism (**Pawson & Tilley, 1997**) (e.g., what is the 'causal power' of a policy), the general idea is that every Mechanism has *causal powers* – referring to those powers to, and powers of change lying dormant/'latent' sometimes, but potentially becoming 'activated' at other times as those *tendencies* of entities observable in the Empirical for example. Here being 'active' and 'inactive' are two mutually exclusive states each causal power can be in under a particular circumstance and point in time, often in interaction with other entities (and their powers) co-present.

To the realist evaluator of impact, Mechanisms are sometimes thought of as processes (**Westhorp, 2014**), in the sense of relating to entities undergoing ongoing *processes of change* leading to the outcomes observed. In the technologies of our *material* world for example, we see few exemplars of evidence for Mechanisms, with processes of change quite as able to adapt to the full diversity of the circumstances we live in and adapt to as members of the human species (current Artificial Intelligence rhetoric notwithstanding).

When we turn to think about our *social* and *human* worlds, Realists draw attention to their key decision making and choice aspects, proposing that all Mechanisms relating to these areas of our existence have significant *reasoning* aspects. Taking our ourselves as social actors, realists argue that we each 'see' in the potential or actual changes introduced to us (by a policy, programme, etc.) a sort of 'resource' – which affords particular *opportunities* or *constraints* for actors' choices and ensuing actions (**Jagosh, 2020**). In everyday terms, when pressed for particular kinds, or amounts of change in ourselves or in our positions/roles of responsibility – we usually think about it a bit… and may respond differently depending on the social roles and 'hats' we have on in choosing our way forward. In terms of Weberian definitions of 'social action', realist premises are coherent with the idea of the particular change making or seeking human beings undertake as being *quite intentional*, as 'social accountants' of the range of possible actions and reactions provoked in those around us by this interpersonal effort. Albeit with variable powers in influencing the changes ongoing in other entities in our plane of existence, for example in the choice of representations of reality given priority within inter-disciplinary research environments (**Bhaskar et al., 2017**).

In trying to then explain the reasoning, preferences, norms, values, collective beliefs, etc. that we bring to bear (see the Values Inventory from Clark and Sousa for a useful long! list (**Clark & Sousa, 2018**)) – on interventions into how we live in relation to others and things, some Realists try to explain these individual or collective patterns of reasoning, preferences, etc. in terms of the social and cultural conditioning known from our Empirical domain (**Kaidesoja, 2013**). Thus, encouraging us to engage in explanatory illumination of aspects of our data using social or cultural theory we know for example, from a literature or knowledge base we trust.

We take for granted that Mechanisms referring to objects in the material realms (like Gravity) for the most part remain 'active' (at least in the domain of the Actual or Real, but Realists challenge us to re-examine this assumption a little, in the belief that *social* and *human* Mechanisms are far more intentional and intermittent – in keeping their 'causal powers' latent

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and inoperative in some particular social contexts, and choosing to activate them in others. The general idea is that Context (as perceived through our individual or collective grasp of the Empirical) may enable or disable the activation of any one of these 'latent causal powers' of social Mechanisms (like us). For example, teachers *teach* (the 'activated' causal power) when they are in *school* (Context), and may or may not find it appropriate to 'teach' when they then go back to their other roles outside of formal schooling, as carer, parent, partner, husband, wife, etc. (choosing to activate or keep dormant/latent the power to teach in these contexts). In current life under COVID, where social roles previously quite separate are perhaps merged more closely (being a mum one moment, and a homeworking employee the next) – there will sometimes be tension and competition in which Mechanism (e.g. me as mum, or me as employee or chief exec) then 'wins', and the associated complex of causal powers then brought into activation in everyday or more extra-ordinary activities (eg mum: cooking some food for kids, employee: typing some work up for a report at home).

Unlike us, few inorganic Mechanisms have the capability for *wilful* change. It is in this distinction between the wilfully animate and inanimate Mechanisms of the universe, that we can then choose to assume or deny the existence of 'Resources and Reasoning' (**Dalkin et al., 2015**) in the realist Mechanism studied.

Mechanisms in the Past and Present

Whilst changes in particular circumstances, contexts, and conditions of life can be documented within the Empirical domain, the realist vision originally saw 'Mechanisms' as existing in a plane beyond, and at a level of generality beyond the concrete entities we see through our current knowledge, technologies, and studies (**Astbury & Leeuw, 2010**; **Pawson & Tilley, 1997**). Other realist research since then seem to have interpreted and defined Mechanisms in evaluation contexts as (**Lemire et al., 2020: 77-80**):

1. entities that *can* be observed in our Empirical reality,

2. entities that *cannot* be observed, and therefore cannot be documented in our Empirical world,

3. 'programme components',

4. participant reactions to these programmes or their components, or as

5. the descriptive or explanatory ideas around the possible make-up, behaviour, and interrelationships of those processes responsible for an observable change.

In light of realism's compromise we introduced at the outset – between its positivist and constructivist principles and visions for science and knowledge – these 5 types of interpretations of the realist 'Mechanism' seems to speak to different facets of realist philosophy, as outlined below:

Table 1: Realist realities and knowledge of these

What is reality, to the critical or scientific realist?	**What can or might be known, to the realist?**
Reality IS capturable through our everyday or enhanced sensory experiences. So Mechanisms *can* be observed as things existing in our Empirical reality (interpretations 1, 3, 4)	*But these 'directly observed sense data' from our attempts to capture reality are NOT the only things which matter in reasoning about the world (because of important things existing in the domain of the Actual and the Real).* So Mechanisms *cannot* be observed 'directly' in full, and therefore exist as things beyond our possible knowledge of the Empirical world (2, 3)
Reality in its Empirical, Actual and Real domains, constrains the reasonable interpretations we might make of it. So the Mechanism in or beyond (1,2,3) our Empirical knowledge then constrains what we make of the world (4).	*But in our working lives as knowers, the 'facts', evidence, and shared reasoning, that we exchange are often equivocal – since they are 'in reality' being produced through the work of quite real, fallible human senses, brains, specialised apparatus and expertise.* *Our data, analyses, syntheses, etc. and ultimately our collective knowledge about some domain of reality then, may often be inaccurate or downright wrong.* So Mechanisms then are those *fallible* descriptions and explanations we have, around the possible make-up, behaviour, and interrelationships of those underlying processes responsible for the Empirical changes we observe (5, with these processes existing in the Empirical or Real domain, corresponding to definitions 1 or 2 respectively)

Realist-constructivist assumptions then – of the equivocal and interpretative nature of the exchange of evidence and ideas – is arguably borne out by the differing interpretations of Mechanism from the current evaluation community (**Lemire et al., 2020**). Where the idea of a realist Mechanism is seen as a construct relating to both the things very much in Empirical reality, as well as in relation to the meta or 'beyond' physical,

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and meta or 'beyond' sensorial aspects of understanding and knowledge exchanged.

Mechanisms of Change and Their Evolving Actions in Systems

So changes that we see as realists then, in the *Context/Mechanism/Outcome* configurations (CMOc) we might document, may really not give us unequivocal knowledge into the operation of underlying Mechanisms and processes in the Real. A general realist argument is that those knowledge artifacts we *can* document and share with each other (through e.g., reference works like papers, journals, books, etc.) may only give us imperfect, somewhat explicit forms of knowledge on these underlying Mechanisms and processes (**Bhaskar, 2008**; **Pawson & Tilley, 1997**). Because realists are concerned with the study of both *social* and *material* entities in the world (including their changes), the existence of 'socially negotiated' Mechanisms or aspects, like culture, class, religion, policies, and programmes, are all Real - and all have 'causal powers' lying dormant, or sometimes activated in the domain of the Empirical (**Pawson & Tilley, 1997**). In particular, realists draw our attention back to the fact that both the *form* (roughly Aristotle's 'formal cause') and *function* (roughly Aristotle's 'efficient' and 'final cause') for social entities like culture, policies, etc. do not appear to maintain invariant relationships to others in the Empirical world, especially as they interact with worldly entities to exert 'causal force' in the world. If we interpret Realism in terms of some kind of *correspondence theory* then (**Schwandt, 2007**), as applied to theorising 'change' rather than 'truth' here, then we might explain those *changes we see* in the Empirical domain as reflective and *corresponding to - changes in the underlying Mechanisms* (or their powers) in the Real.

From what we Empirically know of Mechanisms of socio-material changes in our world then (like schools, political systems, etc), Realists argues that all such Mechanisms are 'open systems' – in the sense of their boundaries being often porous and flexible in definition – as defined in the ongoing flows of people, ideas, information and resources into and out of these systems as they are studied. If we choose to interpret realist mechanisms *as members of the same plane as their effects* (e.g., in extending Aristotle's idea of 'material cause' to the present), the social-material changes in the 'essence' of something being studied (e.g. empirically documentable changes in those people, ideas, information and resources constituting systems) can then be regarded both as a Mechanism in its own right (**Lemire et al., 2020**), and as one of the outcomes of the 'causal powers' exercised by some other Mechanism (in the same plane or beyond?).

In contrast to the above, an exemplar 'closed system' is in those conditions prized by the ideals of high-quality lab research, in which changes in that

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which is studied (e.g., samples and materials, or psychological responses of individuals) are typically highly controlled, regulated, and limited ideally only to the potential differences (pre)defined in measurements of the main independent and dependent variables. Some realists see such 'closed system' conditions of the lab, or intellectual tendencies relating to the de-valuation of learning from contexts and circumstances of life outside of the laboratory/quasi-experiments, very much as an implementation of Hume's constant conjunction theory of causation (**Bhaskar, 2008; Mingers & Standing, 2017; Kaidesoja, 2013; Sutton et al., 2022**). Of course our knowledge of changes in the underlying 'essence' of Mechanisms as manifested in laboratory or everyday life (as above) could be quite imperfect, in light of the realist-constructivist idea of the *eminently fallible* nature of what we think we know from the Empirical domain (because of, e.g., the Platonic inclination taken forward particularly in *critical* realist literature – in the existence of entities of significance to the empirical in some meta-physical/'transcendental' reality). More practically, it might help to clarify at least a little in advance the *boundaries* of the specific Mechanisms and systems we are thinking collectively about (**Mingers & Standing, 2017; Westhorp, 2014**) – in analysing the changes documented as part of a Realist project.

Change is arguably the main constant for us – especially when one thinks about historical evolution of the social and human aspects of our research worlds, in additional to its material constituents. Realists recognise this, in arguing that Mechanisms will for the most part be in a state of ongoing change, development, and evolution in their own right. In another words, research projects are justifiably considered as Mechanisms also, since they involve significant intervention upon other Mechanisms (e.g. an experimental research project 'intervening' on the biological Mechanisms of its human subjects). Even in evaluation research projects where the researchers have no intent to be part of the reason for major changes to current circumstances of, or in the entities being studied, one might argue each project participants' knowledge and experience of 'research' at the very least, will change at least a little in light of their interactions in and around the work of a project of shared learning.

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So Why do Entities Change? Are they truly improving or degenerating?

In contextualising realism in light of the diversity of other views shared so far, Aristotle's 4 causes of how and why entities are the way they are (including his theory of change) is in essence an optimistic theory of *improvement* – in explaining the change we see in entities due to their **progression towards some 'ultimate positive cosmic purpose'** in the universe (e.g., in an entity's existence in the Empirical, Actual, or Real). Depending on the position taken on whether Mechanisms are concrete entities potentially accessible through our current knowledge and technologies (see Table 1), you could justifiably argue both *for* and *against* the idea of a Mechanism's 'ultimate cosmic purpose' as existing in the Empirical domain. According to Mingers and Standing 2017 (**Mingers & Standing, 2017**), the central idea of causation within critical realism is that *change* (in the sense of events of note to our mind or in the external environment) are believed to occur *'as a result of the interaction of relatively enduring mechanisms that have particular properties or causal powers'*. These 'mechanism entities' of realist philosophy may or may not be observable via the senses (**Mingers & Standing, 2017**; **Lemire et al., 2020**; **Rudolph, 2017**) (depending on disciplinary preferences and meta-physical tendencies in context of the interpretation in this article). Realist ideas of a Mechanism can include both quite *abstract* things (like the social institution of *state education systems* and their formation as analysed by Archer and Skinningsrud (**Archer & Skinningsrud, 2022**)), as well as being a useful idea for revisiting the more *concrete* mechanisms as independently discovered or established within specific empirical literature and disciplines (e.g., in studying *dynamic trade-offs* in generating resilient health care everyday (**Sujan et al., 2019**), and in the study of *performance variability* in studying the adaptations of complex systems towards safe and successful daily functioning (**Sujan et al., 2020**)).

In terms of the 'causal powers' analyses and syntheses encouraged by critical and scientific realism, changes relating to the entities we observe can be explained as due to the causal powers available from the current properties or features of other 'relatively enduring generative mechanisms/systems' (**Mingers & Standing, 2017**) – to *circumstantially* generate the observed changes in quantity or quality documentable in the Empirical strata in naturalist or laboratory settings. An example of such a property is a 'researcher Mechanism's qualification in some academic field, leading to their improved powers to learn more academically and generate higher quality quantitative or qualitative ways of seeing and knowing – for example in coming into possession of the 'personal feature' of being newly qualified in an emerging academic knowledge discipline

such as Routine Dynamics (**Huang, 2021**); in terms of the Aristotelian theory of change/causation reviewed earlier, the idea of 'causal powers' can be regarded as a contemporary case of his reasoning around 'efficient causes' for how and why things are the way they are. In this case the learner becomes 'disciplined' into those intellectual, technological, and normative practices of the underpinning profession or knowledge discipline due to their interaction with other key entities in academic training and postgraduate academic learning – e.g. research degree supervisors, disciplinary colleagues, degree policies and procedures, study data, etc. – in the '*ensembles of [circumstantial] beliefs, behaviours, artefacts, and practices that create change in the everyday practices of others'* (**May et al., 2022**). As reviewed earlier, the Aristotelian 'efficient cause' is the only form of reasoning directed *away* from an explanatory strategy centred only on the entity being explained (i.e., away from explanation only in terms of an entity's basic essence, form, and ultimate purposes for existence).

Aristotle's mentor Plato on the other hand, was more concerned with a theory of change as a theory of *degeneration* rather than improvement (**Popper, 1963**), resulting in a pessimistic view of worldly entities as changing because of an *ongoing process of degeneration from their unchanging and indestructible primogenitors or 'ideal models'* (historically originating from some ancient point in space and time). Unlike the worldly entities we might see in the Empirical or Actual today, Plato saw these primogenitors as sitting forever *apart* (as entities distinguishable rather than indistinguishable) from that which might be observed through our worldly senses/sensory instruments. In other words, as a sort of underlying 'original essence' perhaps in the realists' Real domain, whose degenerative and imperfect descendants are the 'sensible things' accessed through our intellectual or technological grasp.

Both Aristotle and Plato's theories are of course *meta-physical* theses (i.e., relating at least in part to things beyond the purely physical and material), in the sense experienced by learners when working with any ideas in research beyond the level of data recorded about the strictly material and physical human experiences of the universe. Their theories of change as improvement or degeneration respectively, can also be seen as *deductive*, in the sense of being a set of existing ideas about the world (from Aristotelian or Platonic thought) which later thinkers may choose as a point of departure to then elaborate on, test and evaluate in light of the other things known from their own investigations, and perhaps challenge as, e.g., insufficiently deterministically or stochastically 'true' in our own Empirical worlds. In terms of some kind of *coherence theory of the truth* (**Schwandt, 2007**) about *change*, Aristotle's theorising of change as a sort of improvement towards our ultimate cosmic purpose, coheres well with

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others' ideas about our ongoing quest for self-perfection (**Montessori, 1989**), expression of our grand freedoms in our everyday lives (**Burchard, 2014**), and activation of the full potential of our human spirits (**Maslow, 1943**).

But none of these theories of changes as a kind of improvement, quite offer the answers we sought at the outset, as they pay little direct attention to the finding and question we started out with, around why our attempts to change (as a process of improvement or degeneration) often works out differently, in different circumstances, and in light of our different social roles and 'hats'.

In the final section then, we draw these previous thoughts together to pause in our explorations, to reflect on what realism provides to meet this need for circumstantially-inclined, abstract explanations, in light of all that we've discussed so far.

So Why do Our Attempts to Change work out Differently, under Different Circumstances, for Different People?

So why do attempts to enable meaningful change involving human entities work out differently, in different circumstances, and in context of our different social roles and 'hats'?

In answer to this original question, realist approaches suggest the following common features to consider in our explanations of this phenomenon:

1. As relating to beings with agency, the social and material/physical aspects are both important to consider in knowledge of *human* existence and its changes. As organic beings, our capacity to wilfully change and be changed by our circumstances and conditions of existence, is important to pay attention to in claims to know – e.g., in seeking knowledge of that which is important in considering changes within social-material realms of our existence. As suggested in the title of this article, the realist perspective and review offered in this article, justifies the idea that mechanisms of social and material/physical change sometimes co-occur alongside each other (e.g., in learning to adjust to new social settings, alongside changes e.g., relating to the phenomenon of greater or lesser neuroplasticity of our brains).

2. In realist terms, we might justifiably see human beings as 'Mechanisms', where the different social roles we learn to play in the wider world often bring different sets of 'resources and reasoning' to the fore; in this way often changing the *social* and *material* circumstances of current existence for ourselves or others

in minor or major ways, depending on our 'in role' behaviours and actions on the grand stage of life. In trying to understand how social Mechanisms (like us) interact with other entities of the universe then, understanding of the situated 'resources and reasoning' in action really matters! (**Hinds and Dickson, 2021**, **Albers et al., 2020**). For colleagues active in naturalistic forms of research (particularly within uncontrolled study settings and circumstances), this principle is unlikely to cause significant doubt. If one chooses to, this situated 'resources and reasoning' can be thought of as integral parts of the Mechanism studied (**Dalkin et al., 2015**).

In engaging with other entities as *wilful* social Mechanisms and actors then (along the lines of Aristotle's 3rd type of reasoning for the how and why of things, about 'efficient causes' in causal interaction with other entities), attempts to change sometimes *work out differently for different people* because of variations in the type and amount of 'resources' actors see others as bringing to the table (an insight coherent particularly with the 'Contextual Integration' Mechanism offered by a realist reading of Normalisation Process theory for example (**May et al., 2022**)) – in the sense of the other wilfully animate or inanimate Mechanisms around us affording particular opportunities or constraints for *our own* choices and actions. The reasoning Mechanisms (like us) then engage in then, on the basis of the abstract or concrete resources perceived, is seen by some realists as socially and culturally conditioned from our previous experiences/biographies in the Empirical domain – leading to the actual patterns of reasoning, preferences, norms, values, collective beliefs, etc. documentable in empirical study of similar or differing human experience and tendencies. (Think about studying the possible differences in relating to 'the same' employment law in the role of an employer, or as an employee for example.)

3. Under a realist lens, an important part of the learning we do and share is then in trying to distinguish between *Mechanisms*, their *Context of manifestation* or *Context of existence* (both interpretations are supported by existing realist literature), and the *Outcomes* resulting from co-occurrences in the changes relating to these Context-Mechanism dyads (e.g., in identifying CMO configurations from evidence). Depending on your own position on the need for *less* or *more* universal definitions of key ideas in various parts of our learning processes, one could see the existing heterogeneity of CMOc definitions in an evaluation research context (**Lemire et al., 2020**) as either *flexible* and thus highly adaptable to local knowledge needs and circumstances (e.g., of

academic disciplines), or downright confused! For example, quantitative colleagues might choose to combine realist CMO ideas with the basic idea of a *variable*, resulting in realism influenced ideas of *'context variables'*, *'mechanism variables'*, and *'outcome variables'* in studying change or as associated with the same units of observation; for qualitative colleagues, the interest might be more in the *contextual aspects* of the milieu in which the (often human) *case* exists, its *causal powers* which were or were not triggered by these contextual aspects of the case's current status and situated existence (in seeing the case as a realist Mechanism made manifest in or outside of lab conditions), and in the changes in outcomes brought about from the described and defined *'case context'*, '*case mechanism(s)'*, and the interaction between context and mechanisms defined on this qualitative research basis.

4. The realist approach to explanation philosophically foregrounds 21st century human beings' extensive capacities to adapt to, as well as reshape their current circumstances of existence, in interaction with the other entities of earth. Our capacities of adapting to and reshaping the conditions of existence here is a fact particularly coherent with the realist premise:

   - that the observed changes in quality or quantity in the Empirical are not only in service of seeking the mathematised *relationships* between *Variable* entities (e.g., as seen in experimental studies aiming to demonstrate 'causal force' via, e.g., correlations between *Variables* under experimental conditions),

   - but more about seeing these observed qualitative or quantified changes as *traces* left by *entities with the power to actively change, and also be changed considerably by their contexts and conditions of existence* (those traces including correlations… then being the main objects of realist documentation, data, and evidence).

5. If you are interested in maintaining the popular ideal of 'standing apart' from those subjects, objects, ideas, etc. prominent in our experiences (especially in scholarly communications about them)… realist approaches do not particularly disagree with this ideal. But where *scientific* realist colleagues tend to associate at present with the Aristotelian ideal - of those impressions from our senses and sensory experiences being 'contiguous' with those subjects and things of abstract thought (with their own independent existence and life), *critical* realist colleagues are more open to the Platonic possibility that the entities of human thought ultimately exist in a

(pristine) realm *beyond and forever 'discontinuous' from…* and therefore never truly a part of the ongoing progression of events in our spaces and times. For those interested in pursuing the Aristotelian thesis, the careful reasoning and 'demarcation criteria' you go on to develop (e.g. about the basic essence/Nature of things, their changing forms, causal interactions, or their final purposes of existence) arguably has limited need of the '**Real**' planes of reality proposed to be existent underneath or beyond the planes of the **Empirical** and **Actual**; but for those more philosophical inclined and investing in the possibility of things of influence… from an *intransitive* realm of existence discontinuous from our empirical experiences as Plato proposed, the 3rd **Real** plane of reality seems to be a perfect candidate for these things and influences to exist in, whilst still accommodating for the empirical progress much lauded in contemporary times within the other 2 planes of realist reality.

Despite current divergences in scientific interpretations of key realist premises and constructs in the literature, realists do also broadly agree on the idea that different Contexts in the Empirical domain can activate different sets of dormant 'causal powers' – constituting features of Mechanism entities (perhaps residing in one or more of the 3 planes of reality as proposed by Critical Realism). Think back to the teaching example mentioned earlier for example, where a person's power to teach (a Mechanism's 'causal power') in social interaction with their student is perhaps activated only in school life rather than in the home?

Returning back to the thoughts in Table 1, it would appear that one can choose to see both Mechanisms and their causal powers, as existing in the domain of the Empirical, Actual, or Real – depending on the received realist wisdom chosen, in further developing the realist idea of Mechanism.

Attempts to change sometimes *work out differently in different circumstances* then, in part because of the differing 'activation potentials' for actors and their particular causal powers, held (in some way) in the circumstances studied. To extend the thought, perhaps something like a particular Empirical Context being *encouraging*, *suppressive*, or *neutral* with respect to a particular type of actor, social-material actions or changes, or causal powers developed in the human project of bettering and improving one's self and lot in life?

I'm reminded here of a discussion I had with a medical colleague, who commented on their training as doctors to observe things in such a way as to fit *biomedical explanatory models* (of disease and illness phenomena); this stuck with me because it resonated with what I was also learning

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elsewhere about the medical knower's dilemma in general: over whether to conceive of their objects of learning and practice as part of *objective*, *biological* Nature, or as entities residing in *socio-cultural* domains of change (**Good, 1994**). At present, realist ideas seems to have received significant development in the literature along both these lines of reasoning (i.e., along more material and social lines respectively).

In seeking to change *your* mind about the topics covered, I hope to have interested you in exploring a realist sense of the Empirical, Actual, and Real in context of your own research community or readership's basic explanatory ideas, theorising, and assumptions, in particular about how we as social actors fit into our natural and artificial worlds.

These contributions are of course limited in their origin from the perspective of an 'early career' qualitative researcher: whose work regularly involves ongoing negotiation of the signifiers or indicators of phenomena, their signified or constructed/experienced meanings, and a general analytical search for ways of *uniting these into meaningful signs* which make sense in relation to existing ecologies of ideas and meanings I visit in various projects (see 'Meaning' in Given (**2011**)). As would be realists then, this article perhaps offers you food for thought in your own attempts in joining others to make inroads, into understanding the naturalistic and manufactured 'causes' of the universe at a deeper level than as they appear in their surface forms (**Leenaars et al., 2020**; **Bratianu et al., 2020**).

Irrespective of whether you try to explain those changes you see in your Empirical world as a degeneration from, or progress into more ideal forms of life then, I hope the thinking above serves as one resource encouraging of your own reasoning around these ideas.

Acknowledgements

Huayi has mixed methods experience and research expertise across both academia and industry, routinely collaborating with senior colleagues in both spheres. Huayi works mostly as a qualitative primary care health scientist currently, but past collaborations include, for example, working with a chief statistician in searching for new variables viable for statistical modeling. His original research has been published in top Elsevier publications such as Safety Science, as well as Lecture Notes in Computer Science and journals for secondary and primary care (e.g., an editorial in the British Journal of General Practice). He is also an occasional columnist for drkriukow.com.
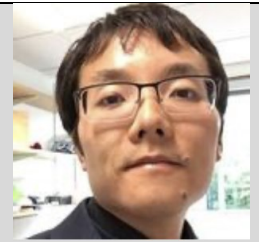
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Endnotes

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