

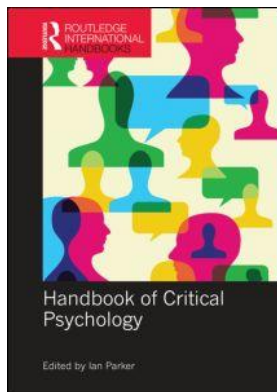
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Cognitive psychology

From the bourgeois individual to class struggle

Michael Arfken

In terms of the impact of an intellectual movement, few developments in the history of psychology compare to what has come to be known as the cognitive revolution (Gardner 1985). Since the middle of the twentieth century, nearly every aspect of psychological research and practice has come to bear the imprint of the emergence of the digital computer, the rise of cybernetics and information-processing theory, and the mechanization of the human mind. Insofar as cognitive psychology has come to colonize nearly every facet of psychology in general, it is clear that any program worthy of the name 'critical' must interrogate the commitments and assumptions underlying orthodox theories of cognition. To do so, it is necessary to appreciate many of the changes and transformations that have contributed to the development of modern cognitive psychology.

The evolution of cognitive psychology

According to the classical model of cognition – or what is commonly referred to as *cognitivism* – psychological processes are fundamentally computational processes involving the systematic manipulation of discrete symbols (Johnson-Laird 1988; Newell and Simon 1981; Pylyshyn 1984). The origin of these symbols can be traced to the sense data that individuals encounter as they navigate their world. By converting this data into symbolic form, it becomes possible to systematically transform what would otherwise be a chaotic collection of sense data into a relatively coherent representation of reality.

These symbolic transformations are guided by mental rules that organize information in a systematic fashion. Although individuals are sometimes aware of these mental rules, more often such rules operate below the level of awareness. For cognitivism, providing a psychological explanation for systematic variations in thought and behaviour ultimately involves identifying variations in the *content* of these rules. In contrast, the view that human thought and behaviour is guided by rules involves a commitment to a singular *form* (rules) that provides a basis for psychological explanation. So while cognitivism recognizes that mental rules are socially, culturally, and historically contingent, this is predicated on the view that all human thought and behaviour is fundamentally rule-governed. Indeed, this commitment is not only treated as a universal feature of human mental functioning, but it has also become a template for what constitutes a legitimate psychological explanation.

There are several advantages to using the digital computer as a model for human mental processes. To the extent that a scientific explanation is construed in mechanistic terms, the computational processes occurring between the input of information and the output of orderly behaviour can potentially be reproduced on a physical machine. In principle, this makes it possible to furnish an exclusively mechanistic explanation of our psychological processes. Moreover, one can abstract principles from this process that need not be tied to any particular physical medium such as the computer or the brain (Dreyfus and Dreyfus 1988). This means that researchers can pursue an empirical research program largely divorced from neurophysiology.

While classical models of cognition view mental processes as proceeding in a series of discrete steps, *connectionism* suggests that as mental activity reaches higher levels of complexity, it becomes advantageous to develop models of human cognition in which these processes both operate in parallel and are distributed rather than localized (McClelland et al. 1986). According to connectionism, the basic building blocks of cognition are units which maintain a certain level of activation. Units with different numerical weights are linked together through a network of connections, and the activation of any individual unit has the potential to excite or inhibit the activity of other units. When a unit becomes active in the presence of a novel stimulus, it initiates a spread of activity across the entire network. This activity can change the parameters of the entire network so that further encounters with the stimulus bear the imprint of previous experience (Bechtel 1987; Smolensky 1988).

Proponents of connectionism argue that in some instances, distributive models of cognition appear to provide a more realistic model of human performance. For example, by emphasizing the weight of activation for different units of a network, connectionism seems to be in a better position to simulate the smooth degradation of performance that is characteristic of a wide array of human activity. Moreover, while classical models of cognition continue to excel at basic tasks requiring reasoning and problem solving, connectionism has shown promise in other areas of human mental functioning, such as pattern recognition (Bechtel 1987).

There is considerable debate surrounding the relationship between cognitivism and connectionism. Some advocates of connectionism argue that given what we know about the brain, distributed models of cognition seem much more plausible at a neurophysiological level than traditional information-processing models (McClelland et al. 1986). Others have argued that connectionism is perhaps best understood as a subsymbolic paradigm that addresses the microstructure rather than the macrostructure of cognition (Bechtel 1987; Smolensky 1988). Still others have argued that while connectionism may be adequate at the level of neurophysiology, a serial/modular view of cognition remains a more robust psychological explanation of human mental functioning (Pinker and Mehler 1988).

Despite important differences between cognitivism and connectionism, both tend to begin their analysis at the point where information has already been captured through a separate perceptual system. The emerging field of *embodied cognition* is in some respects a reaction to this largely disembodied view of human cognition. According to one embodied approach – grounded cognition (Barsalou 2008) – traditional models of cognition treat perception and conception as independent systems. Such an amodal view of cognition fails to appreciate the extent to which perceptual and conceptual systems are integrated so that our experience is grounded in the very nature of our embodied engagement in the world. As we have seen, cognitivism's commitment to a computational view of mental functioning makes it necessary to transform the non-symbolic information received through the perceptual system into symbolic form. In this process of transduction the perceptual modality through which the information is received becomes irrelevant. Grounded cognition argues that by integrating perceptual and conceptual

systems, it becomes possible to develop cognitive models that address the embodied nature of our experience while remaining congruent with the latest neurophysiological research.

Cognitive psychology and its critics

While connectionism and grounded cognition point to some significant problems surrounding the classical view of cognition, it is clear that a number of assumptions guiding cognitive psychology as a whole remain largely unchallenged. Indeed, the evolution of cognitive psychology can best be understood as a series of reforms in which internal critiques have been deployed to salvage a set of core commitments regarding the nature of human thought, knowledge, and experience. In contrast, the most radical critiques of cognitive psychology have tended to zero in on the underlying philosophical anthropology that makes something like cognition the point of departure for many of our modern institutions, from liberal democracy and political economy to moral theory and jurisprudence. For these more radical critiques, the evolution of cognitive psychology must be transformed into a revolution that challenges the epistemological foundation of modern thought (Taylor 1995).

To begin with, critics have drawn attention to the orthodox view of *perception* within cognitive psychology. Central to cognitive psychology is an assumption that our encounter with the world is fundamentally indirect, so that in our everyday activities we initially encounter not people or objects but rather a collection of sense data that must be enriched in order to construct a coherent representation of the world. Leading the charge against theories of indirect perception are ecological psychologists, who argue that our perception of the world is fundamentally direct and involves the detection of information already available in the environment (Gibson 1979; Michaels and Carello 1981, Reed 1996). Central to this critique is a redefinition of the very notion of perception, so that organisms perceive not so much a series of time slices or snapshots but instead events extended in time. One of the most important consequences of this novel view of perception is that it becomes necessary to interrogate orthodox assumptions regarding the relationship between organisms and their environments.

Within cognitive psychology, organisms and environments are traditionally viewed in spatial terms so that organisms – much as physical objects – are treated as occupying a certain space within a particular environment. For cognitive psychology, this moves in the other direction as well, since it is assumed that organisms carry around internal representations of their environments. Ecological psychologists argue that traditional cognitive models produce an animal–environment dualism that supplies the very justification for indirect theories of perception. As an alternative, they suggest that the point of departure for exploring perception should be a synergistic system made up of both the animal and the environment (Michaels and Carello 1981; Turvey and Shaw 1977). Here activity points not to a process residing in our heads but instead to a practical engagement between an organism and its environment.

The traditional emphasis on sense data and animal–environment dualism has important methodological consequences for cognitive psychology. If we assume that perception refers to cognitive processes that enable individuals to construct a coherent representation of the world, priority will be accorded to producing artificial contexts where maximum control of the conditions can be assured. For Gibson (1979), the attempt to study perception in a controlled environment with exposure devices, headrests, and tachistoscopes tends to make us think that perception can be broken into a series of time–frame moments and reassembled in the mind. Yet this view of perception arises not from any facts about perception but as a consequence of a commitment to an atomistic and mechanistic view of psychological explanation. In this sense, ecological psychology remains a powerful critique of cognitive psychology not only because it

calls into question these atomistic and mechanistic assumptions, but also because it provides an alternative framework for the scientific investigation of perception.

By redefining perception as a practical activity, ecological psychologists have challenged the atomistic and mechanistic assumptions that inform not only traditional theories of perception but also our very understanding of the nature of psychological explanation. In a similar vein, scholars drawing on phenomenology (Dreyfus 1992; Taylor 1995) and ordinary language philosophy (Coulter 1989; Coulter and Sharrock 2007) have pointed to issues surrounding cognitive accounts of *skilled performance*. At the heart of many cognitive accounts of skilled performance is a view that orderly and structured behaviour must follow from the application of discrete (though often implicit) rules. Viewed in this way, the project for a psychological account of human activity is largely geared towards making these implicit rules as explicit as possible. In principle, such explicit knowledge (or 'know-that') could fill the pages of a book that social actors metaphorically possess at one level or another.

At stake here is whether we must assume that all knowledge can be made explicit as a collection of rules or if it is necessary to make room for a type of practical knowledge (know-how, as opposed to 'know-that') that resists being transformed into discrete propositions and rules. Since orthodox cognitive psychology is largely dedicated to a mechanistic view of psychological explanation, the suggestion that certain types of knowledge cannot be transformed into discrete rules and propositions appears to those working within the cognitive tradition as a capitulation to mysticism and an affront to the development of a psychological science. One place where this tension is particularly acute is in research on expertise.

According to cognitive psychology, the transformation of a novice into an expert in a particular domain involves a prolonged process of accumulating a large number of relevant rules. Since an expert is defined as someone who understands exactly what a particular situation demands, cognitive psychology assumes that such knowledge must be a massive collection of rules for guiding skilled performance. Yet for Dreyfus and Dreyfus (1988), this view of expertise is the inevitable outcome of adherence to a mechanistic model of the mind. They suggest that the development of expertise is best understood as the development and refining of practical skills in an ongoing situation. This means that what remains vital for the novice (i.e. explicit rules) ultimately becomes a hindrance for highly skilled performance. While cognitive psychologists argue that this merely indicates that in the development of skilled performance mental rules become increasingly implicit, Dreyfus and Dreyfus argue that another possibility exists – that the expert does not follow rules at all. Pointing to work in the field of Artificial Intelligence (AI), Dreyfus (1992) argues that many of the obstacles AI researchers have encountered in their attempts to simulate human intelligence on a digital computer can be traced to the mistaken view that intelligent human behaviour follows from the application of discrete rules and propositions. Here the frame or common sense knowledge problem has made it necessary for AI researchers to reflect on the philosophical commitments that inform their mental models (Dreyfus 2007; Dreyfus and Dreyfus 1988).

If we assume that the development of a scientific psychology necessarily involves translating all human knowledge into discrete rules that can in principle be programmed on a digital computer, it becomes necessary to explain how we can formalize all the rules that make it possible for individuals to navigate their world. Surveying the myriad forms of human activity, it becomes clear that our point of departure for acting appropriately in a particular situation is a sense of what is relevant or important about that situation. By framing a situation, it is possible to identify the unique characteristics that distinguish one situation from another. But within cognitive psychology, relevance or significance must in principle be something that can be formalized as a collection of rules. The consequence is that we appear to require rules for identifying rules.

But because the frames that indicate relevance are *about* rather than *in* situations, the result is an infinite regress (Dreyfus 2007). Indeed, recent developments in AI have largely arisen from abandoning the mechanistic, rules-based epistemology that guided early attempts to simulate human mental functioning (Brooks 1991; Dreyfus 2007). These efforts have in a number of cases drawn inspiration from ecological psychology and its critique of indirect perception.

One of the consequences of challenging the assumption that human activity is governed by mental rules or that our experience of the world is mediated by mental representations has been increased interest in the nature of the *background knowledge* that makes it possible for people to navigate their world (Dreyfus 1980, 1992; Taylor 1993). As we have seen, cognitive psychologists not only recognize the importance of background knowledge in providing a context for our experiences, they suggest that one of the major goals of cognitive research is to make this knowledge as explicit as possible. Yet critics argue that the very nature of this background knowledge is such that it functions only when it operates behind our backs (Dreyfus 1980). From this perspective, attempts to bring such knowledge into the foreground amount to little more than a mechanistic colonization of human experience (Taylor 1995).

The struggle here is between cognitive psychologists who assume that our encounter with the world is primarily theoretical and indirect and critics who argue that the very possibility of adopting a detached, disembodied, theoretical stance towards the world is itself only made possible by our practical, engaged, embodied activities (Dreyfus 1980; Taylor 1995). By challenging the view that social activity is necessarily governed by mental activity, critics have endeavoured to show that the mental space staked out by cognitive psychology is itself a social accomplishment. This provides a means for shifting attention away from the *mental* activities of individuals and towards the *social* activities and those spaces between people that make anything like cognition possible (Taylor 1995).

For cognitive psychology, the point of departure for analysing social and cultural behaviour is the mental activity of individual social actors. Yet critics have argued that the very nature of our background knowledge is such that anything we might call mental activity must ultimately be derived from our collective *social practices* (Dreyfus 1980; Taylor 1995). The emergence of the practice turn in social theory (Schatzki et al. 2001) has propelled investigations of social activity in a number of directions. On the one hand, the primacy of social practice has created a space for an empirical research program grounded in a non-cognitive account of human interaction. On the other hand, the practice turn has also served as a catalyst for deploying grammatical investigations in an effort to destroy any coherent conception of the cognitive or the mental.

For scholars working within the tradition of Discursive Social Psychology (DSP), the topic of cognition plays an important role in a variety of contexts (Edwards 1997; Potter 1996). To begin with, DSP emphasizes the importance of locating what are traditionally viewed as cognitive processes within the realm of social and discursive practice. Here discourse is treated not as the expression of an interior mental process but instead as an intersubjective practice in which social actors produce particular representations of reality. Central to the production of these representations is the use of psychological terms (i.e. feel, knows, believes, intended) to buttress or undermine particular versions of events. Drawing on the analytical tools developed by ethnomethodology and conversations analysis (CA), these scholars have sought to establish a post-cognitive research paradigm that is sensitive to the role that ordinary talk plays in the negotiation of social reality.

Other scholars suggest that when the issues addressed by cognitive psychology are submitted to conceptual analysis, it becomes clear that what are viewed as central problems surrounding the mind and the brain are actually grammatical confusions that require conceptual intervention. For example, Coulter and Sharrock (2007) point to the tendency in cognitive psychology

to transform *achievement* words into *process* words. So while playing, travelling, and seeking are clearly processes, winning, arriving, and finding are better understood as achievements. Overlooking conceptual facts such as this make it possible to treat something like remembering or seeing as a process that requires cognitive explanation rather than an achievement embedded within a social practice.

For Coulter (1989), conceptual clarification reveals that any discourse surrounding the mental is fundamentally incoherent. While we may be excused for using mental terms in our ordinary language, Coulter argues that it is vital that we identify and discard conceptual confusions that continue to plague our professional discourse. In this regard, conceptual intervention represents a formidable challenge to the development of any coherent science of the mental.

While there are important differences between a grammatical investigation focusing on the limits of intelligibility and an empirical investigation of the situated deployment of mental vocabulary, both critiques suggest that the recent turn to social practices has important if not devastating implications for cognitive psychology as a whole. Moreover, by making their point of departure practical rather than theoretical, critics of cognitive psychology have laid the foundation for productive collaboration among a range of traditions from phenomenology and ordinary language philosophy to ecological psychology and standpoint epistemology.

From culture to political economy

At their best, radical critiques of cognitive psychology call into question the atomistic, mechanistic, and representational foundations of modern epistemology. In many cases, these critiques have gained traction by inverting the traditional relationship between action and cognition so that mental processes are themselves treated as a form of social practice. While this certainly moves us in the proper direction, it is important to avoid equating social and *cultural* practices (Arfken 2012). Insofar as cognitive psychology is treated principally as a form of cultural imperialism, resistance often amounts to little more than fetishizing the local and marginal in the hope that the mere presence of alternative perspectives will give pause to the neoliberal juggernaut. This runs the risk, as Fraser (2003) observes, of allowing political struggles to become entirely consumed by cultural critique while injustices surrounding the social relations of production run rampant. Despite some notable exceptions (Parker 2009; Reed 1996; Shotter 1987; Still and Costall 1991), critics of cognitive psychology have rarely ventured into the domain of political economy. Indeed, the overwhelming tendency has been to view modern epistemology as a manifestation of Western culture rather than an expression of the underlying logic of capitalist accumulation.

To see this, it is important to understand which substantive issues proponents and critics of cognitive psychology view as simply off limits. As we have seen, cognitivism in particular argues that our background knowledge can in principle be formalized into a collection of explicit rules that guide our everyday activities. To call this assumption into question is to challenge the very possibility of providing a legitimate psychological explanation. In contrast, critics of cognitive psychology argue that what cognitivists view as the basis of psychological explanation is actually the expression of a contingent and increasingly dominant cultural practice. While this observation is intended to destabilize Western imperialism, in reality it transforms culture into an incorrigible entity that is even more impervious to scrutiny (Pollner 1974). This is particularly clear in contemporary multiculturalism, where marginalized social practices are accorded the status of a culture in an effort to insulate them from critique. While the aim is to challenge the ascendancy of a single, dominant worldview, one of the unfortunate consequences is that the possibility of establishing a foundation for challenging the legitimacy of any specific social practice (dominant

or otherwise) is radically undermined. Indeed, by focusing exclusively on cultural domination, critics have largely forfeited their ability to trace the evolution of cognitive psychology to developments in the capitalist mode of production. In this way, the politics of multiculturalism may inadvertently reproduce a system of economic exploitation (Arfken 2013; Michaels 2006).

One of the advantages of placing cognitive psychology within the context of political economy is that it makes it possible to integrate various critical elements that would otherwise remain only loosely related. As we have seen, ecological psychologists emphasize the engaged and direct way in which organisms explore their environments. In a similar vein, hermeneutic phenomenologists argue that the subject/object dualism central to cognitive psychology is itself derived from a more primordial engagement that blurs the boundary between an individual and his or her context. While these are certainly important insights, it is vital that we add another critical component. Through Marx's (1844/1964) concept of *alienation*, we can begin to see the chasm separating people from their creations, from one another, and from their world as more than an expression of a dominant cultural worldview. From the perspective of political economy the abstract and mechanical models that lie at the heart of cognitive psychology are an institutional expression of the alienation of labour under the capitalist mode of production. In this sense, cognitive psychology is not so much a cultural movement but rather an embodiment of alienation itself.

Another reason for grounding critiques of cognitive psychology in class struggle is that it prevents revolutionary concepts from being appropriated for essentially reformist purposes. A case in point is the notion of an *affordance* which is central to the ecological critique of indirect perception (Gibson 1979). In the hands of grounded cognition, affordances have been transformed into theoretical entities that are viewed not only as compatible but actually vital to an indirect theory of perception (Semin and Smith 2008). Yet when affordances are placed within the context of class struggle, we can see the rise of a market in wage labour and the transformation of use-values into exchange-values as a process of estrangement or re-affording in the service of capital accumulation. Once again, by linking the practice turn with political economy, it becomes possible to forge important links between revolutionary class struggle and ecological critiques of indirect perception (Reed 1996).

Of course, the danger in reorienting the turn to social practice towards a critique of political economy is that the contemporary reduction of the economic to the cultural is repeated in the opposite direction. To avoid this, it is important to understand that drawing attention to the economic foundations of exploitation makes it possible to dismantle the very class differentials that often serve as the vehicle for marginalizing social and cultural groups. Put somewhat differently, if the existence of a system of economic stratification is what makes it possible for one group to extract material advantage from the exploitation of another group, it becomes clear that the turn to social practice is necessarily a class as well as a cultural struggle.

Conclusion

In *The Condition of Postmodernity* (1989), David Harvey asks whether the historical transformation in the twentieth century from Fordism and scientific management to more flexible forms of accumulation represents a radical shift that gives birth to a new postindustrial age or is instead merely a course correction in which the capitalist mode of production adjusts to an increasingly global economy. Placed within the context of this question, it is possible to read the evolution of cognitive psychology against the grain. Looking at the mechanical models of the mind developed by cognitive psychology, one is struck by the similarities between these models and the organization of labour under Fordism and scientific management. Indeed, insofar

as scientific management endeavours to transform the knowledge of the labourer into a set of explicit instructions that can be used to increase the pace of work (Taylor 1911), the development of cognitivism can be viewed both as an antecedent and a consequence of transformations in industrial relations. Yet because the ambitions of capital remain entirely exposed in cognitivism and scientific management, it became necessary to construct models of the mind in which these naked ambitions are obscured. In this way, the internal critiques of cognitive psychology (i.e. connectionism, grounded cognition) serve as a useful means for further extending and entrenching a system of exploitation.

Turning to the radical critiques of cognitive psychology, we must ask whether these critiques disturb the hidden economic foundations of modern cognitive psychology or whether they actually play an increasingly vital role in obscuring those foundations. To the extent that these critiques have treated the primacy of social practice exclusively as a cultural phenomenon, the manifest differences between internal and radical critiques ultimately conceal an underlying logic that threatens the greater part of our planet with a host of problems from ecological devastation to compulsory servitude.

For Harvey, while postmodernism claims to be a radically destabilizing movement, a closer look indicates that its obsession with dissolving all moral, ethical, and political foundations leads it to view the notion of class struggle as little more than an antiquated grand narrative. The consequence is that legitimate concerns regarding the economic structure of society become little more than language games that players are free to adopt or discard at their convenience. What is often lost in much of postmodernism is that the needs of vast segments of the population have little to do with the play of difference or the politics of recognition (Michaels 2006). For those living under the crushing weight of economic exploitation, it is the social relations of production that matter most.

This is all the more important to keep in mind since the movement that perhaps is in the best position to challenge cognitive psychology – hermeneutics – has too often been hijacked by postmodernists who see the impossibility of bringing our background knowledge into view as a sceptical tool for undermining *any* system, revolutionary or not. For critical psychologists who see class struggle as more than a vestige of some bygone modern discourse, the path forward involves integrating the ontological shift in hermeneutics and the practice turn in contemporary social theory with the Marxist analysis of the social relations of production under capitalism. While the development of more radical approaches to embodiment is a promising sign, it is important to ensure that these developments bring renewed attention to the structure of human labour and the importance of class struggle.

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Website resources

- Being in the World* (Movie): <http://beingintheworldmovie.com/>
 Discourse and Rhetoric Group (DARG): <http://www.lboro.ac.uk/departments/socialsciences/research/groups/darg/>
 Discourse Unit: <http://www.discourseunit.com/>
 The International Society for Ecological Psychology (ISEP): <http://www.trincoll.edu/depts/ecopsyc/isep/>

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