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DESCRIPTIVE EPISTEMOLOGY

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A great deal of literature has been generated over the controversy of what, if anything, epistemology and cognitive science have to offer each other. Toulmin, Goldman, Swain and others have commented on the value of scrutiny of the intersection between the two disciplines. (Toulmin, 1971; Goldman, 1978)

Crudely stated, the immediate problem appears to be that epistemology has generally been regarded by philosophers as a normative enterprise. How knowledge or belief is acquired has generally not been the philosopher's concern. Rather, the emphasis has been on what the standards for knowledge *ought* to be, and on how a belief could be justified so as to maximize its epistemic worth and render it worthy of the title "knowledge". Cognitive science is, of course, descriptive. The normative "ought" has comparatively little place here. Instead the emphasis is on an accurate portrayal of the processes in question, regardless of how far this portrayal departs from some idea. (Neisser, 1967)

D.W. Hamlyn, addressing the somewhat more narrow question of how a Piagetian "genetic epistemology" might be thought to be related to epistemology *simpliciter* writes:

> Many, if not most, modern philosophers would reject such a method [genetic epistemology] of clarifying what is involved with the concept of knowledge. Questions about the genesis of our ideas, if by this is meant the genesis of ideas in the individual, are questions for psychology, not epistemology. (Hamlyn, 1971, p.3)

But there are at least two areas of contemporary epistemology, I shall argue, which might profit from exposure to some of contemporary cognitive science. If the well-worn three-pronged definition of knowledge as justified true belief is trotted out (however objectionable it may appear epistemically, since the counterexamples to it are celebrated and numerous), (Gettier, 1963, and responses to it) the triad of claims usually looks like this:

1. p is true
2. p is believed
3. one has adequate evidence for p

Clearly, work in cognition might be able to shed more light on both points 2

and 3.[1] But, it may be rebutted, the original problem still remains – it is not that one requires descriptive light shed on these points, however intriguing that may be, but that (to satisfy the epistemologist) such light would have to aid us in our normative aims.

Clarifying the nature of belief might well be a task in which cognitive science – or any descriptive work – could be of some help, but I will not devote any space to that particular issue here. Rather, I want to examine the third point – the notion of adequate justification – with regard to the contemporary science of the mind, cognitive science.

II. *Justification Theory*

Epistemologists have tended to approach the notion of justification from two different vantage points. On the classic foundationalist view, one belief or knowledge-claim-under-attack is taken as fundamental. Fundamental in what way is, of course, the crucial question. In many earlier theories, it was assumed that whatever was fundamental was an empirical or observation statement that was somehow incorrigible. (Suppe, 1977) If one glosses "incorrigible" as not subject to refutation, it is clear that many foundationalists (at least in the initial stages of foundationalism) thought of the fundamental statement as an empirical analogue to analyticity. Typically, the bedrock statement of the foundationalist schema served in such a way that any belief or knowledge claim could, if necessary be traced back to it. The pragmatic difficulty of filling in such a chain (if "chain" it may be labelled) was not supposed to stand in the way of the theoretic cleanliness of being able to make the required tracing.

Still another methodology for epistemic justification relied on the coherence of a set of beliefs or knowledge claims. Rather, the network or web of the claims, if it contained no obvious disparities of a P & -P nature, was itself the testing ground for a new belief or knowledge claim. This view might be thought of as somewhat more intuitively appealing than the foundationalist view, since we have some dim awareness of having "clusters" of beliefs. But the very clustering itself creates a difficulty, since to provide the requisite degree of justification for a belief might mean that an enormously large set of beliefs would have to come under examination. I might, for example, decide to form an epistemic network of certain scientific theories and their corollaries in order to provide the right sort of justificatory set for a belief. But this is difficult – not only is the very size of such a set open to criticism, its scope and rigor seem beyond that which would prove useful in the course of the mundane unless the epistemic agent were, in fact, some sort of scientist.

A certain sort of way of looking at these broad groupings of justification

[1] Belief with regard to empirical claims is, on the descriptive level, related to the work on pattern recognition and memory cited in Neisser, 1967, and work consequent upon Neisser's original studies. Although we do not intend to treat of belief here, there is no question that such treatment could be made. See also Tulving and Donaldson, 1972, and Hunt, 1965.

theory tends to emerge after a cursory examination of them. The theories are, by and large, normative and not descriptive. We already alluded to the difficulty of actually tracing the foundationalist chain (or delineating the pyramid, as some would have it), and clearly the coherentist only appears to be better off at the outset. In an everyday situation, I might very well be able to produce a justificatory set – but whether it would be up to the task of actually providing thoroughgoing epistemic justification (rigid enough to satisfy the skeptic) is another matter.

Might we not think that what these theories of epistemic justification really lack is a descriptive component? To take but one example, Cornman, a coherence theorist working with a conception of explanatory coherence borrowed from Lehrer, notes that ". . . the crucial problem for an EC – [explanatory coherence] theorist is to find a nonarbitrary way to restrict the statements that [explain or] are to be explained . . . the resulting set is still too large . . . The natural way to eliminate further is not available to an EC-theorist." (Cornman, 1978, pp. 243-244) Coherence theories vary in scope and rigidity, but the problem of size is one which seems to accrue to most such theories.[2] One task, then, for a theorist laboring in the intersection of cognitive science and epistemology, might be to try to develop a notion of justificatory set that is more descriptively accurate.

Let us try initially to be more explicit about the notion of justificatory set. Such a set, according to the coherentists, is simply that set of beliefs and knowledge claims I hold which, taken in *toto*, serve as the standard against which an outside belief or knowledge claim might be measured. Many of the theorists speak of a statement's being justified and serving a justifier simultaneously – for instance, the statement that Secretariat won the Triple Crown in 1973 may be justified by its coherence with a number of other statements while simultaneously serving as a justifier for the statement "Sham did not win the Triple Crown in 1973". Now a descriptive version of a justificatory set would presumably try to show how individuals do *in fact* justify their claims. I take it that this is a cross-cultural, non-discipline relevant practice in its broadest portrayal. That is, I take it that the process of epistemic justification occurs in China, as well as the United States, and that biologists, car mechanics and ballerinas all justify their claims. One justifies one's claims in response to a challenge – either a challenge from others or a challenge from oneself. The utterance of sentences in response to that challenge is at the core of the justificatory process. The ballerina may be challenged as to whether a certain sort of *plié* is appropriate for a given *pas de deux*; a car mechanic may be questioned about a carburetor, a biologist about what purports to be ribonucleic acid. All then engage in a process which, I claim, can be modeled. It would not seem an insurmountable obstacle to develop a descriptive theory of the procedure of epistemic justification which would enable one to be

[2]See also, for example, Lehrer, 1974, and Levi, 1980, if Levi may be thought of as falling under the broad rubric "coherentist".

specific about the elements of a justificatory set; presumably, this would answer at least Cornman's concern directly, since the resulting set would not be limited in an arbitrary way, but would in fact be the "nonarbitrary" sort of limiting device which, according to Cornman, represents a "crucial problem" for the coherence theorist.

Our intuitions about the process of epistemic justification suggest that: (a) the enterprise does not come about in circumstances where an agent's claim is unchallenged.[3] (b) The procedure of epistemic justification is one of responding to some sort of skeptical challenge or inquiry about one's beliefs or knowledge claims under attack. Even a sketch of the response leaves us with the conception of (c) a series of utterances, some from the skeptical challenger (or some in the form of a challenge), and (d) some from the epistemic agent responding to those utterances. Thus a descriptive theory of the enterprise of epistemic justification might take our intuitions – as set forth in the foregoing – as a point of departure, generalize over them, and utilize work from cognitive science to help us obtain greater descriptive accuracy.

It may bear repeating at this point that when I say "skeptical challenge", I do not mean to give an account of how the skeptical challenge *ought* to be answered to silence the intellectually astute skeptic. Standard normative justification theory already purports to do this. Rather, I mean simply that I probably will not feel it necessary to justify my utterance "Sham did not win the Triple Crown in 1973" unless that utterance *is* challenged. Only an emotionally disturbed person engages continually in the process of justification when not challenged. But perhaps my response to a challenge about my belief about Sham will consist of "He's the wrong color for a Triple Crown winner". Normatively, I have not justified my claim – and the sophisticated skeptical questioner knows this. Yet, in many contexts, this answer will suffice; on a descriptive level, the process of epistemic justification will have occurred. It is this process I wish to model. Just as the normative epistemologist may attempt to set out necessary and sufficient conditions for knowledge, I wish to set forth conditions which provide us with an instance of epistemic justification.

Some sort of theoretical device is needed if we are to respond to the challenge of the coherentists and find ourselves in a position to pinpoint the justificatory set. It is needed because as indicated earlier, certain coherentists have pleaded that no further progress can be made because they have no nonarbitrary way to distinguish between competing justificatory sets; it is also needed if one believes that an "ought" implies a "can" and that what we recommend for ourselves epistemically is something we should be able to perform. At the same time, descriptive accuracy compels us to remember that our theoretical device must have a point of departure rooted in everyday activities – it is precisely this lack of orientation which is noteworthy in the standard normative theories. The work in cognitive science previously

[3] We may always, of course, think of the agent himself as presenting his own challenge.

cited has been influential in the formation of new theoretical work by Terry Winograd, a computer scientist, by Roger Schank, also a computer scientist working in artificial intelligence, and by John Searle, whose most recent work might be thought of as a philosopher's contribution to cognitive science. We will refer to some of this work at a later point; for the time being, we note that our descriptive theory will not serve the same purposes as a normative piece of work. Normatively speaking, the limited justificatory set to which I have referred would require riders in order to preserve the epistemic guarantee of truth, but this is no more than has already been done in several sorts of theories of knowledge, particularly those labeled "defeasibility theories". (Klein, 1971; Swain, 1978).

So far we have concentrated on sketching an instance in which more descriptively-oriented work, presumably drawn at least partly from contemporary cognitive science, might aid in epistemic justification theory working from the standpoint of coherentism. Our descriptively-oriented work will focus on the way in which claims *actually are* justified, rather than the way in which they ought to be justified; we work from the intuitive standpoint described [(a)-(d)] earlier. But we should not think of our work as having some use or value only for the coherentist. The foundationalist might well be able to utilize such work, too. Complexity of justification chains has typically not been such a salient issue for the foundationalist, since the bedrock statement has frequently been an observation statement, and thus questions of whether or not certain theorems of quantum mechanics are allowable as justifiers have tended not to arise.[4] The *foundationalist* faces a different sort of problem, however – the nature of the basic statement itself. There has been a tendency to want to be able to say that a certain type or sort of observation statement is best suited to serve as a foundation. Various candidates have been offered, and with varying degrees of epistemic strength. The heyday of incorrigibility having passed, foundationalists tend now to speak of "self-justifying" or "self-warranted" statements, or, to use the Chisholmian term, "self-presenting" statements. (Chisholm, 1980; Pastin, 1978) Statements subsumed under the label are presumably suited to perform a certain kind of task within the framework of the theory. However propitious it might seem to be able to sort out the relevant kinds of statements, compelling counterexamples remain to a sort of statement's being recurrently trustworthy as a foundation. The counterarguments presented in Austin's classic *Sense and Sensibilia* are still very well taken, and Lehrer has presented another group in the opening sections of *Knowledge*. Austin, at least, seems to think that the way out may be to let context deem under what circumstances a fundamental statement can serve. But this, surely, brings us back to our very point.

If the claims of those who argue against the foundationalists on this point of the nature of basic belief are well taken, then surely we need to have some sort of descriptive apparatus at work which will enable us to distinguish

[4] Such questions do arise for the coherentist, however, See Cornman, 1978.

between those circumstances in which the statement legitimately serves and those in which, as Austin claims, it appeared to me that I saw magenta, but was simply wrong. Theoretically, were neuropsychology completely developed, the tracings of the neurons in the one case could be compared with those in the other, and this matched to verbal reports about pattern recognition, etc. This sort of work is currently simply beyond the purview or capacity of any discipline. But we can develop a notion of justifying set that is descriptively accurate, based partially on the work of the three thinkers cited earlier. So here again, at least on an argumentative basis, a case can be made for a more descriptively-oriented view of the procedure of epistemic justification.

Clearly, one area in which contemporary epistemology might benefit from the descriptive work of cognitive science as a whole, then, is justification theory. We have cited two main extant strands of justification theory – foundationalism and coherentism – and tried to show how each is weaker than it might be because of its lack of descriptive adequacy, even at a primitive level. We have the large and unwieldy justificatory sets of the coherence theorists, and the vulnerability of the basic beliefs of the foundationalists, particularly in those theories where the basic beliefs are thought of as a sort of type. We have concluded that the current justification theories are so normative as to be counterintuitive to our notions of epistemic functioning, where we have characterized such notions as relying on the concept of epistemic challenge and response to that challenge (usually verbal) in the form of justification. This area would seem to be one that might well be fructified by the addition of work from the descriptive sciences.

III. *Cognitive Science and Epistemology*

Recent literature in philosophy of psychology, epistemology and certain other areas is awash – one might say half-drowned – in references to the influences of the computational metaphor in cognitive psychology and hence cognitive science in the past fifteen or twenty years.[5] Rather than rehash the beginnings of the influence of artificial intelligence and computer simulation on other areas, one might do well to heed the succinct statement of Margaret Boden on this head:

> Programs written with primarily technological aims often employ computational procedures which there is not reason to believe are paralleled in living organisms. However, it is frequently the case that the best way of solving a technologically conceived problem within artificial intelligence is to try to mimic the way the human mind solves similar problems, so the distinction between 'artificial intelligence' and 'computer simulation' is by no means clearcut. (Boden, 1981, p.8)

[5] Only a few citations can be given here. The recent contretemps between Searle on the one hand and Dennett and Hofstadter on the other in *The New York Review of Books* (1982) is merely an addendum to previous work by all three authors in this area. See also Goldman, 1978, and Savage, 1977.

Work in artificial intelligence, then, however divorced it may seem initially from work in the social sciences, often slides into such areas. The upshot of all this for epistemology is that an epistemology which attempted to make use of current cognitive science might very well find itself utilizing the computational or information processing viewpoint, and hence, ultimately, work in artificial intelligence itself.

At an earlier point in this paper, we referred to three theorists in cognitive science broadly construed whose work might aid us in the formation of a more descriptively accurate theory of epistemic justification. The first of these, Terry Winograd, writes in a recent issue of *Cognitive Science* of a change in his thinking about the functioning of natural languages. In one of the back-and-forth, give-and-take exchanges typical of current cognitive science, Winograd, a computer scientist, has now been influenced by some philosophers and cognitive psychologists, some of whose work had originally been influenced by computer science itself. In any case, Winograd writes:

> Formal approaches to meaning often take as their model the language of mathematics, in which it is generally assumed that the truth of a statement can be determined without reference to outside context or situation. (Winograd, 1980, p. 236)

The importance of context cannot be overstressed, particularly if the process of epistemic justification is thought of as a largely verbal procedure of challenge and reply. Reliance on context might help us to limit the scope and size of the justificatory sets; reliance on the notion from a theoretical standpoint might help us to develop a theory which would portray the process in a general, schematic way. We might suppose that the notion of context is not so arcane that it requires tepping outside philosophy, even momentarily, in order to adduce it. And yet almost no epistemologists – standing as they do in the normative tradition – have made such use of the notion.[6] The focus has *not* been on an epistemic agent as an information processor working in a context, rather the focus has been on what an idealized agent ought to do.

Schank and Abelson, also working in cognitive science, have developed the notions of SCRIPTS, THEMES and GOALS. Part of what it means for us to behave appropriately in a given setting is that we act out routines taken from certain internalized data which might be thought of as a SCRIPT: the SCRIPT, for example, of being a well-known philosopher giving a paper at a large philosophical conference. In this SCRIPT, hurling ice cream at an opponent is inappropriate behavior recognized as incompatible with GOALS and not appropriate for the SCRIPT. (Schank and Abelson, 1977, passim) I take it that we may regard this as descriptively accurate; the epistemic agent, too, has a script. Silence in the face of the skeptical challenge, physical assault on the skeptic (however justified morally), or the utterance of

[6] An exception to this has been the work of David Annis. See Annis, 1978 for a programmatic sketch of a contextualized theory of justification.

jabberwocky and nonsense syllables count as inappropriate. The primary GOAL, obviously, is some acquiescence – usually verbal – on the part of the skeptic that signals his challenge has been met and that his queries are over. In other words, justification has taken place.

Finally, to expand in a similar direction using other recent work, John Searle's piece in the volume *Perspectives on Cognitive Science*, edited by Donald A. Norman, ties together notions of context dependency in utterer's meaning and listener's interpretation with notions of appropriateness of behavior in a way which, I claim, will help us to model the procedure of epistemic justification. Searle's piece on intentionality reminds us that commands are formulated in such a way that one has not fulfilled a command unless the action so resulting was done with the intention of fulfilling the command. In other words, it is not enough that the action *merely* be performed, for it could be performed accidentally or for the wrong sorts of reasons. (Searle, 1981, pp. 213-214) If this sort of intentionality is allowed to have any validity at the speech act level, it might be immediately apparent that the social process of epistemic justification probably makes use of it in something like parallel fashion. In other words, to view epistemic justification descriptively might be, at least in part, to take note of the speech acts and utterances which are constitutive of it. We might then readily assent to the contention that part of what it means to be convinced by an argument is that one is convinced for the reasons adduced in the argument. Thus, if the skeptic backs off from his initial attacks, or agrees with the epistemic agent, he must agree for the right reasons. Socially speaking, one could cut off one's attack or end one's skeptical challenge for the wrong sorts of reasons, and a descriptive view of epistemic justification would presumably take note of this.

To make the locus still more specific, if such work were to aid us in justification theory, one can imagine how it might be helpful in the specification of and diminution of the size of the justificatory set. Suppose that afferent/efferent relations are simulated by input/output relations. Then suppose that the verbal input of the skeptical challenger to an epistemic agent is met with verbal output from the agent. Immediately, there is coding, storage and retrieval of information. We might think of each utterance of the agent in response to the verbal output – Searlian intentionality operative – as providing us with one member of the justificatory set.[7] The sum total of such utterances, taken up to the point where the process is truncated or concluded (usually by some agreement or acquiescence on the part of the skeptic), is constitutive of the justificatory set. This sort of view makes it highly unlikely that the justificatory set would suffer from the problems of size or scope of inconsistency alluded to by Cornman, for example, (Cornman, 1978) unless the epistemic agent were in fact a practicing physicist or someone whose sets ordinarily included theorems of mechanics, Newtonian or otherwise. In fact,

[7]Since our view here is not intended to be normative, it does not matter if the utterance in question actually provides justification or not.

on this view the epistemic agent's response is similar to Dretske's description of a subject's response to subjects of type O, with the crucial difference that intentionality is involved.

> Suppose objects of type O have a peculiar effect on humans; they induce a kind of neurological activity (call it N) that quickly, in a matter of minutes, manifests itself . . . If we suppose that the neurological state N is specific to objects of type O, we can describe the subject's reaction to O in informational processing terms. (Dretske, 1977, p. 113)

If cognitive science, or some portion of it, were thought of as concomitant to certain strands of epistemology, work in justification theory would seem to be a natural starting point. The enterprise of epistemic justification on the descriptive level seems to lend itself rather naturally to the descriptive level seems to lend itself rather naturally to the strings of output analysis, and a slightly more sophisticated rendering would call for the intentionality which Searle mentions. A new sort of justification theory might then emerge. The theory would be contextual, but not normative, and hence unlike the one contextualized normative theory to be found in the current literature. (Annis, 1978) The theory would be descriptive, since it would attempt to portray the process of epistemic justification as engaged in by an epistemic agent, rather than what the process *ought* to be if truth and/or strengthening of belief claims is the end.

The theory would rely for part of its impetus on current work in cognitive science, but would be useful from the standpoint of contemporary epistemic justification theory since it might aid the coherentist in reducing the size of his justificatory set, or aid the foundationalist in establishing a chain that is reliant on context.

IV. *Conclusion*

We began by wondering what, specifically, might emerge from the quest to tie together contemporary epistemology and cognitive science. Acknowledging that the former has generally been perceived as a normative endeavour while the latter is in some sense descriptive provided us with the impetus for trying to be precise about the ways in which these two fields could be intersected. It was claimed that the three-pronged definition of knowledge, however deficient epistemically, might help us to pinpoint the area of intersection. Both the nature of the belief itself and the nature of epistemic justification seemed fruitful areas of endeavor. We did not here try to develop how belief might be investigated along these lines, but Sections II and III sketched a line of inquiry for justification theory. In Section II we looked at current normative justification theory with an eye toward specific weaknesses in the theory which might be ameliorated by a more descriptive approach. In Section III a crude descriptive view of the process of epistemic justification was provided, relying in part on strands of work by Winograd, Schank and

Searle. It was asserted that if the process of epistemic justification is thought of as one developed by speech acts of two epistemic adversaries, the utterances of the one (the agent) in response to the utterances of the other (the challenger) might be thought of as comprising the justificatory set. A final suggested modification is that there be an intentionality condition on the agreement of utterances which would terminate the string and provide the cutoff point for members of the justificatory set.

We have attempted to investigate merely one portion of contemporary epistemology from the standpoint of its relevance to work in cognitive science, but the inescapable conclusion from the examination of both lines of thought is that normative work might profit from greater attention to the descriptive element. Hamlyn is correct when he suggests that, historically, such attention has not come about. But the problems of the normative justification theorists are such that their work virtually cries out for some small descriptive adequacy.

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