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IS COGNITIVE PSYCHOLOGY ANY USE IN REMEDIAL TEACHING?

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Addressing, for the most part, fellow experimental psychologists studying cognition, and particularly of course those with some educational brief - whether self-imposed or thrust upon us - I would suggest that we listen to the people who tell us that we are not experimenting very well (e.g., Allport, 1975; Bartram, 1980; Blackman, 1980; Bynner, 1980). They are often raising, implicitly, the issue of whether, even done extremely well, it is worth doing at all (Hebb, 1974). Everyone or no-one, now or ever, may believe in the value of some scientific activity, but how can the individual scientist shuffle off responsibility in this matter? I am beginning to suspect that for some of us 'valuable' should mean 'useful', though the sense is one that needs careful definition.

In this age of cost-benefit accounting in research - the intelligent in full pursuit of the relevant! - psychologists are quite ready to speak of the value of their work both now and forever, or, if not now, then certainly forever. In accord with this spirit of the time cognitive psychology and education are being drawn irresistibly together, exemplified beautifully by Farnham-Diggory's recent book on learning disabilities (Farnham-Diggory, 1978). She claims that, while we cannot help the current generation of learning disabled pupils, we are usefully and appropriately engaged in trying to help future generations (op.cit. p. 10). We simply have to find out 'exactly what is wrong' and get a 'strategy that works for sure' (op.cit. p. 20, p. 74). Much needed reassurance comes from the assertion that the science for the job is to be found 'somewhere in the domain of cognitive psychology' (op.cit. p. 20). Such indication of buried treasure appeals both to the educator and the cognitive psychologist in me; but can I be sure that, when I have voyaged and laboured for my prize, it will be more than fools' gold?

The first question for us to ponder is whether people actually or automatically want to know what we have to tell them. Surprisingly, most people, unlike our experimental subjects, are neither naive, purposeless nor passive, and, as advertising agencies know, but experimental psychologists do not, you have to be sure both of what your audience is looking for, and of your power to make it recognize the value of what you have to give. The assumption that experimental cognitive psychology has something that teachers, parents or children need and want demands examination. I am heartened when Farnham-Diggory asserts that there is reciprocity of need and want here (op.cit. p. 20), but this too needs clarification. In a shared enterprise there is always a sense in which each side needs the other. Perhaps we ought to start defining the position in a little more depth and detail.

Philosophers do try to help. So, if we are to take up the challenge of securing this market we might usefully start with Ryle's apposite comments on psychology's task (Ryle, 1949, pp. 307-308):

> Nor does the teacher want to hear about any backstage incidents in order to understand what made the boy get to the correct answer of his multiplication problem; for he has himself witnessed the front-stage incidents which got him there ...
>
> Let the psychologist tell us why we are deceived; but we can tell ourselves and him why we are not deceived.

In the light of this it is possible I think, to deal with the issue of whether and how we could give teachers what they want and need, and to clear the ground for a useful study of (school) learning and teaching by experimenter-psychologists.

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Ryle is surely right to give priority to the account explaining the behaviour of successful school learning by the incidents known as teaching the child. Teaching and learning are linked in the reasons for, purposes of and beliefs about such incidents. If the desired end is not gained then the incidents are repeated and regrouped towards it, as part of the teacher's skilful job performance. It is not necessary for teachers to hear of mysterious happenings behind the scenes to explain their doings. The pupil-teacher transaction being one of observable incident, what teachers want to learn of would be ways of varying these incidents. They do not need, and certainly do not wish to be given, the impression that they are really doing something else.

Unfortunately, this is exactly what experimental cognitive psychology has to offer, if Farnham-Diggory is taken as an example. It is an offering in terms, not of front-stage incidents, but of backstage processes. Or at least it seems to be, until one realises that we experimenters are unable to get at the hidden processes in our models except by reference to front-stage incidents. It might be argued that we are fully aware of what we are doing, i.e., of the 'conceptual' status of our models. My suspicion is that it is an operationalising or descriptive enterprise, with a dash of hastily prepared generalisation, so as to seem something more. Experimental cognitive psychology is really good when it is about tasks and task descriptions; the trouble starts when tasks are paraded, consequently or antecedently, as representative of other tasks. This generalisation is inappropriate for the purposes of teachers, and my feeling is that cognitive psychologists should take seriously Ryle's argument about front-stage incidents, and then look at and talk about specific instances of teaching-learning behaviour, if we want to explain why teachers may be deceived in what they do.

That we do this may be as important for cognitive psychology as it is for teaching, for the comments above echo existing criticism of the fashion for investigating learning behaviours - when these have already been subtly transformed and reified by the language of intellectual ability and deficit - using a hypothetical 'process' terminology tied entirely to specific experiments or tests (Mann, 1979). This linguistic ploy disguises the fact that a description of performance in one situation is being put forward as explaining performance in another. In what sense, I ask, does getting a particular score in digit recall 'explain' lack of success at school? Many would see the explanatory force going the other way; but, in either case, what happens at school must surely be looked at when doing the explaining. Where attempts to assess or improve performance in a given setting have taken the form of estimating the efficiency of, or trying to improve, performance in another, the track record, apart from in the matter of the employment of psychologists, has not been impressive (Mann and Goodman, 1976).

In saying that teaching problems or learning disabilities should be discussed at the level of front-stage incidents, I must caution that Ryle is not advocating behaviourism as a substitute for operationalism. The former he regards as offering an impoverished and even less helpful account of the front-stage happenings of interest (op.cit. pp. 308-311). In Ryle's view, to use the word 'intelligence' is to talk about something, and this something is not a hidden thing called 'intelligence', operationalised or not. It is a real and important quality of certain incidents and experiences, open to all for inspection and comment. In short, it is just the sort of thing that behavioural scientists, in particular, might be expected to select as an important target for their slings and arrows.

We have to give cognitive psychology its due in the sense that its methods and the concomitant precision of its descriptive language have their place in dealing with the front-stage incidents of learning. Farnham-Diggory thinks this, and turns, somewhat briefly, aside from her normative modelling exercise to suggest the value of protocol analysis for helping the individual learning disabled child (op.cit. pp. 144-156). What she does is an

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informal task analysis (based on cognitive 'theory' of course), followed by empirical observation, followed by some hypotheses about the deficits of the child. This follows the general logic of experimentation of the cognitive type, and neatly demonstrates its flaws in this area: it does not deal with a teaching-learning situation, it gives an account in terms of backstage processes and the empiricism is inconclusive at best.

While, therefore, I could not agree more that 'by thinking carefully about what learning disabled children are actually doing ... we can make a highly effective start on designing new, individualised methods of diagnosis and remediation' (Farnham-Diggory, op.cit., pp. 155-156), I maintain that the need is for us to think more carefully about what we are actually doing. Farnham-Diggory sees her job as organising some theoretical possibilities from which follow some diagnostic and remedial possibilities (op.cit. p. 155), whereas I see things exactly the other way round. A proper theoretical perspective is the last thing that will be achieved, following extensive and appropriate observation, and it is to be hoped that theory will be something more than the putative normative task descriptions that it is for Farnham-Diggory. Even in her own terms these task analyses are not particularly useful points of departure, since there is no guarantee that the task as a learning disabled individual does it will resemble any norm: quite the opposite, one would think. Inevitably, then, she leaves the reader with the hypothesis of deficit, and no guide to remediation - save, of course, ordinary and careful teaching, which, being what many teachers actually do, with or without psychologists, would seem to be very much in need of study (see Brophy, 1979, for a start here).

All this may be admitted by many cognitive psychologists, who know that they have toiled all night and caught nothing. The crucial question is what we could do that is better. We know how to observe and measure certain performances to make complex and impressive discriminations between specific tasks, even if we keep calling them theories. Is continuing this activity going to bring us nearer to understanding behaviour - is it, in other words, simply that we are at the beginning of a long haul and benefits are not to be looked for yet? Or are we to change our practices more radically?

We can take our cue from Ryle again, noting in his account of what teachers know and want to know the importance of the purpose and direction that it is of the nature of behaviour to have (op.cit. pp. 306-308). The science of this area, it can be argued, will and must be related to purpose and success, because that is what the teaching and learning business is about. I stress that, though we may have to deal with the purposes of behavers, these are not hidden purposes, known only by inference. Front-stage incidents that behavers engage in do reveal their purposes, as surely as they themselves know whether they are succeeding or not.

It is the notion of success that is crucial. For Ryle, success in solving behavioural problems is not in need of explanation by psychologists; this is what the front-stage incidents were set up to do: 'we can tell ourselves and him why we are not deceived'. It is the failures that call for attention, indicating as they do false belief or ignorance: 'let the psychologist tell us why we are deceived'. I would like to argue on this basis that, to explain why specific incidents p^1 do not serve purpose Q, one needs to entertain some other kind of belief about the incidents, which can only be defined by specifying incidents p^2 that do serve purpose Q.

In other words, psychological knowledge will be gained by organising success in behaviour, or putting it another way, by being useful. It is their success-orientation or success-value that is the best thing about many of the 'get the pupil to criterion' methods currently advocated for teaching (e.g., Howell et al., 1979; White and Haring, 1980). Indeed it ought to be possible to elaborate such a notion to illuminate and integrate many disparate areas of clinical and applied psychology, in addition to promoting the study of cognition. I

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shall content myself with offering a few practical suggestions, full knowing that it is the doing of them that will provide the most effective commentary.

The discriminative language for discussing performance that designing and running experiments has given us should be developed, I maintain, in non-normative 'experiments' which seek to remedy learning problems in specific cases. The suggestion that assessment and analysis should take the form of remedial activity is not a new one (Howell, et al., 1979), but there is a need to use cognitive psychology's more sophisticated methods for the description of tasks. The work may resemble the single-subject experimentation done with the neurologically damaged, but the stress would be on guiding the teaching-learning incidents with the psychologist as participant with teacher and pupil rather than onlooker.

The first stage would be detailed observation in which the front-stage incidents would be scrutinised for evidence of success and failure. The cognitive psychologist, having more subtle options for describing what is happening, would hope to see actual purposes and problems not avowed by the participants in the descriptions according to which they instruct themselves and evaluate their output. In the light of this there would follow an engineering of success in learning in relation to the psychologist's description, which would supply an elaborated context for the teacher's purposes. Since the psychologist's description is there as a description of an actual situation (i.e., one oriented to success) in which the psychologist is a participant, this makes his or her description open to validation in the usual way, by success or failure in relation to the shared purpose. The kinds of successes available would be sought by suitably precise but ordinary means, involving instruction, prompting, demonstration, practice, guided self-instruction and so on (see Ryle, op.cit., pp. 291-295; also Brophy, 1979). Careful and methodical observation would constantly refine the account of the situation, guiding the success-seeking, and thereby promoting both utility and the development of a scientific critique. In a sense the experiment does not finish, as the learner continues it in his or her own self-descriptions, and follow-up observations might discover what the learner does with the successes gained, thus amplifying the understanding of the situation.

It will be hard to shake off the habits and prejudices associated with our current self-styled empiricism; to claim that science is about gaining understanding, not doing traditional experiments, provides no guarantee of the value of anything suggested here. The proof of this pudding will be in the eating, the digesting, and the relative merits of the things that follow.

We are commonly told that we are moving into an era of productive exchange between laboratory and real-life preoccupations, and this paper could be taken as an example of such a trend; but I hope I have made it clear that in my view cognitive psychology does not emerge from the laboratory equipped with theory. Some years ago in a paper to a Memory Group meeting (BPS annual conference, Exeter, 1976) I claimed that the value of so-called memory experiments was in revealing something about operative stimulus structure. I would reiterate the point more generally, by saying that over the years experimental models have simply given better descriptions of the things happening. Thus at one time Baddeley would have talked of 'visual processing', but later recognised that the labels 'visual' and 'spatial' need careful discrimination when applied to tasks (Baddeley, 1976, pp. 226-232). It is very much in the same spirit, it seems to me, that he now sees that laboratory tasks require careful discrimination from real-life performing (Baddeley, 1981).

What is missing is a concomitant realisation that discriminating description, while important, will not be enough when dealing with problems people have. As far as school learning difficulties go I am backing an inter-

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vention-based science of the specific situation, and welcome all descriptive methods and subtleties of language, so long as they are directed to, or are capable of being directed to, the achievement of the successful solution. Finally, as I construct my plans to implement a programme of the type suggested, I would ask fellow experimenters in the developmental non-normal cognitive area to ponder how, why and to what extent it matters whether my pupil has to use spatial ability, verbal ability, both cerebral hemispheres, or neither, in doing a task, as long as he or she has made a success of doing it. It is something we have to be clear about.

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