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self-talk and teaching-talk : on the cognitive science of instruction

1.

As recently as the seventeenth century, our thinking, in various ways, took a cognitive turn. Nor can we necessarily blame Descartes. It was Shakespeare who said that nothing is good or bad but thinking makes it so. The blame, then, might be borne by Literature - our essential 'work on language' - for putting thinking about thinking in something of a bind. Given the competition, it is small wonder that nineteenth century psychology and philosophy, doing what came naturally, fled into the waiting arms of mathematicians, logicians and scientists of physical and biological persuasions, leaving theologians and historians to flock with poets and storytellers. What follows is a tale of pigeons coming home to roost.

In a sense, my argument is just 'what I am doing', and well done if I am doing what I am doing well. And this doing is teaching - i.e. is trying to say what I am doing, to teach you, and myself, about what is happening. As Bernard Lonergan taught in 'Insight', published in 1957, insight into thinking can be gained by saying what I am doing when I do some knowing, and doing and saying accordingly. The result is knowledge of method.

And, as I do my teaching, I say that thinking is about what we find ourselves doing, or having to do (and we do not know why, though we can learn from doing it), and doing some thinking is a framework of our own doing about what is happening. Doing some knowing is doing something thoughtfully, as Gilbert Ryle might comment; and doing thoughtfully is doing well.

On another tack, I might say that we gain illumination from not knowing what is happening and yet knowing what is happening, from not knowing what we are doing and yet knowing how to keep up appearances, and by not knowing what is to be done and yet knowing how to do something about it. Why we do what we do may be a puzzle to us, yet we learn from what we do, again and again, and think it worth carrying on.

There is, then, a movement, a carrying on, in our thought and
action. Problems come in what is carried on and, I have come to
believe, occur largely because of a failure to see something that
is happening in front of us all the time in this complex of
knowing and partly knowing.

From movements and their problems, learning, I think, is largely
accidental. It happens to us in its critical moves; we but catch
up as we might say. In its basic form, it is not so much a
change in us as maintenance in the face of the accidental flux of
world-process; and important learning may consist in noticing
what was always (going on) in front of us, but was simply
overlooked, for lack of point or urgency. A great deal of
looking may be needed to notice what is important and that it is
important.

It should be recognised that a scheme by which we understand also
causes us to overlook some things that are ultimately going to
come back and haunt us. In this way, for example, necessary
specialisations of knowledge actually lead to difficulties in
seeing and learning certain things that may be very important.
Solving the deeper problems of the integration of specialisms
means attending to, and not overlooking, these things. This
takes time, as history teaches.

So it is with the procedures and practices of what we call the
experimental or scientific psychology of learning, memory and
cognition. This can, it is thought or hoped, be applied to
problems of instruction. My point is that something that should
have been noticed has not been noticed, leading to this research
being often empirically well-aimed, but conceptually flawed. It
is far less useful, therefore, than it might be. As I discuss
what has been overlooked, I am seeking to develop the view that
the key questions about cognition involve matters of instruction
necessarily and centrally, as well as peripherally. Some key
concepts will be what I call self-talk and self-demonstration -
the components of self-instructive self-rapport.

2.

Talking to oneself has popularly been held to be a sign of
madness, as has hearing voices when there's no-one there - the
receptive equivalent of the one-sided conversation. The history
of psychoanalytic theory should alert us to the possibility that
self-talk or narration can characterise a coping system under
extreme pressure trying to produce a positive result. In the
landmark initial case of Anna O., her self-talk was

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extraordinarily illuminating for Breuer and Freud. Out of it
came, of course, a therapeutic practice which, for all its
mechanist intentions, essentially involved talking to people, and
people talking to themselves. Not overlooking some of the things
Freud overlooked has indeed led in recent years to a discussion
of the cognitive core of his work.

A potted history of psychology and learning/teaching theory could
be given here only by overlooking many things; but it might be
mentioned that many would credit an interest in self-talk, inner
speech or inner dialogue to the work of Vygotsky, known to
english-speaking psychology in increasingly better translations
in the last three or four decades. At the same time, however,
various other traditions of therapy and of learning/teaching
theory alike have provided a fertile soil and a plentiful
watering for Vygotskyan seeds.

Thus it is twenty years or so since it was realised by
'behaviour' theorists/therapists that, in the same way as they
were able to design and apply programmes of analysis and
reinforcement of behaviour to other people, so those people are
able to do this to themselves. From this breakthrough in 'not
overlooking' self-programming come the Self-Efficacy Theory of
Bandura, the 'self-directed behaviour' schemes of Watson and
Tharp and the 'Cognitive-Behaviour Modification' of Meichenbaum.

The last-mentioned is worth pausing over, as Meichenbaum
explicitly uses Vygotskyan notions in his 'integrative approach',
published in 1977 in a 'Behaviour Therapy' series under the title
'Cognitive-Behavior Modification'. Meichenbaum writes of the
uses of training in self-instruction using 'private speech' for
Hyperactive Children and Adult Schizophrenics. But he sees this
as more than just a useful specific tactic. It is illuminative
of the self-awareness operating at the core of the cognition of

both psychological observer and observed client/learner. Both
have to say or name what present action is, as some later
theorists have put it. For his part, Meichenbaum is a self-aware
learner: one of his chapter sections is headed 'What shall we say
to ourselves when we obtain negative results ?'. The self-talk
of psychologists is instructive, of course, to them and to us.
But what, we may ask, is it about, if not instruction itself ?

  Meichenbaum quickly had some effect on information-
processing/cognitive psychologists, but they tended to overlook
the full implications of his demonstration of the need to get
oneself into the picture of one's psychological work. Behaviour
therapy or psychotherapy, even when labelled 'cognitive' was to
them of no more than passing interest. Some, like Farnham-Diggory

in her excellent 1978 text on 'Learning Disabilities', did take a
hint about general models having to be used in specific
instructional assessments of a conversational type. But she was
working explicitly upon instructional activities. Meichenbaum
viewed the information-communication models (and the neurological
models) as premature and narrow. In fact, their creators are
sophisticated observers, describers and labellers. They do not
notice, however, that their model using and naming is part of a
larger context of useful and instructive self-talk about what
they are doing, explicit consideration of which tends to be
relegated to the skeletonic framework of mere 'method' talk.

Perhaps it was difficult at that stage in any case for cybernetic
enthusiasts bowled over by working models not to overlook that to
study some psychological work is to do something that is
instructive - the doing of which is the substance of what is
happening to be studied. They studiously overlooked in some way,
rather than said, what they were doing. Not saying what they
themselves are really doing is the great overlooking of the
psychological experimenters. This would seem to them to be
outside their modelling enterprise, but it is really they who are
enclosed, in an instructional system their deeds cannot but work
with and through, though their words fail to acknowledge this
clearly enough.

3.

Taking method very seriously, as implicated in the very substance
of the inquiry, one can attempt to go beyond Meichenbaum's
position to a further integration. He discusses both 'learning
theory' therapies and 'cognitive restructuring' therapies,
explaining with reference both to observation and assessment
methods, and to the conceptualisation of events, just how the
internal dialogue involving 'inner speech' influences both
behaviour and 'cognitive structures'. From Sokolov he accepts
the foundation notion that: 'Inner speech is nothing but speech
to oneself, or concealed verbalization, which is instrumental in
the logical processing of sensory data, in their realization and
comprehension with a definite system of concepts and judgments'.

It is, one might say, a crucial factor in how we see things, or
organize our consciousness. According to Meichenbaum, behaviour
change occurs through a sequence of mediating process involving
the interaction of inner speech, cognitive structures, and
behaviour and their resultant outcomes. In a first step, the
client becomes an observer of his own behaviour; then new
cognitive structures are developed which permit him to view his
symptoms differently. This particular general notion is not, of
course, original in discussion of therapeutic success. The
further possible generalisation is what is of interest.

For Meichenbaum, the internal dialogue comes to guide new

behaviour, the results of which have an impact on the individual's cognitive structures. Information-communication models and neurological models fail to do much more essentially than provide models and labels for talking and, if these have value, they gain it through use in internal schematic or prescriptive dialogue. For experimenters in cognitive psychology, this dialogue is importantly about method. For Meichenbaum, faced with a client with a problem, a functional analysis of cognitive strategies in the internal dialogue is the key empirical demand. For both experimenter and client, therefore, the key concern is a matter of what they say about what they are doing.

Meichenbaum then discusses analysis of cognition by experimental manipulation of task, environment or instructional aid provided to the client. In this analysis of task for the purpose of empirical observation and assessment it should be apparent that the psychologist's self-talk about method meshes with the client's (or subject's) self-talk as 'teaching-talk'. There is thus fundamentally set up an instructional method for the study of cognition, where cognition is seen as instructive activity quite globally for all concerned. As if to drive this home, Meichenbaum cites Vygotsky's work on 'inner speech' and instruction in a way that has profound implications for the general methodological issue in cognitive science:

'Vygotsky suggested that a most useful way to assess capabilities, especially in children, is to have the client perform a task and then note the degree and kind of improvement that derives from the administration of instruction... For Vygotsky, the individual's ability to employ and benefit from instructions was the best reflection of intellectual capabilities. Vygotsky's use of the child's response to adult instructions is consistent with his view that what the child is able to do only with such help will eventually be incorporated into his own action; eventually the child will internalize the organisational principles that are inherent in the assistance he receives from others. As Luria quotes Vygotsky, "The function which is today divided between two persons will be interiorized and become the independent mental function of the child himself".'

A little later, Meichenbaum comes to self-instruct more explicitly on what is going on and what to do in the matter of psychological assessment, observation or empirical activity generally in the study of cognition:

'However, the assessment is not only an appraisal of the client's internal dialogue but also in itself acts as a stimulus for the client to change his internal dialogue concerning his problem. As a result of the cognitive-functional assessment the client will come to entertain the notion that part of his problem results from what he says to himself.... As a result of the assessment, the client comes to see how he is an active contributor to his presenting problem.'

Studying cognition is a matter of doing some, one might say. But there is some overlookng on Meichenbaum's part too. In his view, it is a limitation of this technology for studying thinking that when we ask someone to verbalize his thoughts while doing a task we may in fact be changing both his thoughts and what he is doing. Assessment and change are interdependent. However, 'if we are mindful of this limitation we can learn a great deal about an individual's thinking style and then relate it to task performance'.

There is something being overlooked in this warning that what the psychologist is doing in assessing the situation is changing the situation. The assessment is causing the client to assess and change as an inevitable part of the cognitive activity system involving both psychologist and other - what I would call the single instructional-activity system. There is reversion in this comment to the 'general static' model whereby cognitive science has to be a sophisticated labelling which makes nothing happen. But this is a misconception of human cognition. The modelling and labelling of cognitive science has its place as an assessment and observation tactic, but serves instructive activity and makes little sense without it. Instruction is not to be the handmaid of cognitive science, but rather the converse. What we are about is not a cognitive science of instruction, but rather an instructional science of cognition.

4.

It would seem best to move to discussion of what I would call the instructional turn (for doing some thinking about thinking about doing something). In speaking of the instructional turn I am signalling that self-talk is a key part of an instructional self-rapport that may be thought of as our part in a wider instructional system involving self and others - ultimately the whole race and its activities in the Jungian collective sense.

I have spoken elsewhere, therefore, of scientific psychology being largely an answering of the question, 'what can be taught

to whom ?'. In the space that remains I want to discuss this
sort of idea in tandem with the notions of self-talk and
teaching-talk (or instructional talk) clearing the ground for a
question I cannot deal with here - namely, 'when, or at what
level, do we need to tell ourselves explicitly what we are doing,
or what is happening to us ?'.

In 'Behavioral and Brain Sciences' for 1987 there is a paper of
J.R. Anderson's on 'methodologies for the study of human
knowledge' in which, from a more orthodox cognitive science
perspective, he comes to a conclusion easily related to that of
Meichenbaum on the matter of studying and changing cognitive
function. The conclusion has also the same limitation, in that
it clings still somewhat to the notion of a closed, static or
mechanist-determinist model of cognitive function, possibly for
various reasons connected with the biological science heritage of
psychological ideas.

Put broadly, Anderson argues that research into knowing has
largely been conducted by giving people instructions to do things
they 'know' how to do. In other words, says Anderson, they are
working at the 'implementational' level, more or less. It would
be more interesting, he claims, to investigate the 'algorithmic'
level. This turns out to be the level at which people have to be
told and have to tell themselves what they are doing - instruct
themselves as it were. In Anderson's own work on intelligent or
advanced tutoring systems, commentators have noted that 'learning
by doing' becomes the key notion.

It is a short step thence to Anderson advocating the sort of
'pedagogic' method that Vygotsky talked of, arising in the
necessary self-study of a cognitive system that does so by
internalising the words and deeds of instructors so as to learn
to self-instruct by doing some self-instruction. Pedagogics as a
methodology is seen as a way into, and heightened awareness of,
the overall rule-acquiring instruction-getting and instruction-
giving system, which is poised to make use of such and to carry
on in the light of such as its essential operation, moving along

the sensitivity to what is happening of cognitive-scientist-
instructor and subject-learner alike.

The point should not, to my mind, be that there is an important
instruction-giving and instruction-getting part of the cognitive
system, to which Anderson is here referring, and of which he is
saying we should take more notice. The point is that
instruction-giving and getting is what cognitive system
essentially does and is. It does not so much take in
information, store and reorganise it, and produce output, as use

such a model as instructive - to tell itself about certain
things that are happening, and carry on in that light.

An information-processing model of the mind of the learner, or
indeed a somewhat broader task-analytic model of the mind of the
instructor, may be proposed or implied for various purposes; but
essentially cognitive system arises in action in the generation
and use of all such models of and from the human conversation, in
some higher integration that permeates the doing of instructive
and meaningful activity.

It can justly be claimed that it is from Vygotsky that we can
take the key notion that we hold a crucial conversation with
ourselves with inner speech, and that we do this because we
incorporate the speech of others and learn thereby some crucial
things at a number of levels, mostly unacknowledged as a rule.
But it might be said equally that this is just one of the things
that happens to us that is particularly meaningful.

There need be nothing peculiarly Vygotskyan about the overall
argument. The notion of the circular reflex, used by Baldwin and
then by Piaget among others, says that we generally are picking
up the things that happen, that we happen to do to ourselves, and
are patterning and scheming them as valuable in making a world
(with a self in it that things happen to and that makes something
of this).

It is important to see that with outer and inner speech come
outer and inner demonstration of an instructive kind. The
possibilities of our doings are outlined and dealt with by us in
both telling and showing. One cannot therefore ignore the
Piagetian account of early development. The language of learning
and instruction will contain doings both vocal and non-vocal.

5.

A few final wild assertions may serve to indicate other tracks I
have travelled and am travelling still. It was noted by
Meichenbaum that 'cognitive restructuring' theorists and
practititioners are easily drawn into a way of talking that
emphasises the model of the internal dialogue and self-
instruction. Harri-Augstein and Thomas have attracted me by
their work on learning within the tradition of Personal Construct
psychology. Their 1985 volume, on 'Self-Organised Learning' is
unnecessarily difficult because of the 'repertory grid' tactics
that clutter the book. What emerges, however, is that they and
their various client groups together are learning by and from the
doing and the 'telling and showing themselves what is happening'
that that doing is framed by. In 'Learning Conversations',
published in 1993, they manage to get some core ideas about self-

awareness to the fore, rather than fussy applications, though the book still suffers from being a amalgam of accounts from different necessarily specific learnings not too carefully woven together.

These authors write about the 'conversational being' and of

'being conversational' to represent the single instructional system in action. Representation is of the essence, and conversation stands as model in order to mean what conscious self-organisation and self-awareness are (about). To talk in this way allows the unit of analysis to be a single human or many humans, or indeed less than a single human, as we hold different inner and outer conversations taken up from time to time in different ways. A conversational endeavour is also a methodological notion, in that, while there is in our doings continuous regeneration of meaning, we know we can converse. When conversational beings begin to model their own processes awareness is created, and what we think of automatically as a self in action is seen to be learned thing, which takes reflection back to the method.

Thus the method is the conversational knowing in action, and the conversational knowing is generated from multiple representations of experience of the method. Models in use are very mirror-like and constantly about themselves - hence the import of self-talk and self-demonstration which together make up the self-rapport that is instructive. The problem, perhaps, is one of stopping the reflection.

The stage is set possibly for using a Rogerian notion of an acting self which is both directive and non-directive in a paradoxical way. For any model is bound to be an observer's model, even when the observer is the self-observing self; but any self-notion is an actor-notion, so that the model becomes a model (in) action. The action is, as in a play, directed and directive, from actor and to observer, and from observer and to actor. Each self will be a learned account in a search for a Rogerian 'congruence' of some kind with reality. This congruence of 'accounts' of the selves in the instructional system is what is worked for by the parties to the overall conversation, or whichever bit of it is in current use.

Dennett in 'Consciousness Explained', published in 1992, has talked of the self as a centre of narrative gravity. Our stories of what is happening to us organise our consciousness and are used like drafts in circulation on various fronts to be updated as necessary. Consciousness is nothing else; it is explained by the instructive point and intent of this activity. I can only

telegraph here something of Dennett's meaning, but some
simplicity may be regained by simply talking of telling ourselves
things (singly or collectively) that we need to know. Dennett
has a story - what else ? - of how the breakthrough in
thought consisted in someone doing to themselves the talking that
others had previously done to them. A person alone by accident
one day simply discovered that they could tell themselves the
sort of things they had previously relied on others to tell them,
and that it worked.

We like to think of consciousness in some other way, but Dennett
feels that we would gain by telling ourselves about the narrative
we tell ourselves. He links thus with Vygotsky, with Meichenbaum
and with Anderson, and, I might add, he believes that the Law of
Effect will not go away, because 'what happens' is, it happens,
instructive -   the stuff of our self-instruction, in my view.

The history of psychology's work is all here. The single
instructional system is obviously the larger context of all this
activity, involving and using self-talk and teaching-talk on all
sides. In this way we can talk, therefore, of our language as
part of a common collective memory for action, re-realized in
various copies born of the creative accidents and intent of self-
instructive individuals in the single instructional system of the

race struggling to maintain its gains. The nature of my self-
talk may firstly and finally be a conversation about what I have
to say and to teach - a conversation in which as teacher I am
learner and as learner I am teacher.

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