

Use of introspection in scientific psychological research

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The use of introspection is unavoidable even in psychological research on animals. Difficulties may arise from the absence of reliable introspective data; it is suggested that this could be the case for the so-called "reward system". In other circumstances confusion comes from using introspection without being aware of it: speaking and thinking have for many years been considered as the same operation, but the reason for this belief is not clearly documented and it may be suspected of being only introspection. Amongst other evidence, a careful and conscious use of introspection demonstrated by auto-analyses of former aphasic patients strongly suggests that language and thought are quite distinct entities.

Keywords: Aphasia – Auto-observations – Introspection – Reward system – Thought-language relationship

The aim of this paper is to show that, since some introspection is inevitable, even in scientific psychological research, it is better to be aware of it and use it critically than to be under its influence without realizing it. It is out of the question to reconsider the condemnation of the introspective methods applied to cognitive psychology as they were used in the early years of this century, in particular by the School of Würzburg. The sanction passed by Watson in 1913 is irrevocable. We shall see however that it is very difficult not to inject a dose of introspection into studies in psychology, even in animals.

A simple example will suffice to remind us of this fact. When we see a rat which is given electric shocks crying, fighting, trying to bite off the electrodes, we think it is suffering and that the procedure is meant to study something about pain in rats. I am not here to criticize the use of this evidence; I merely wish to point out that only through introspection can we understand the rat's reaction: we know that in similar circumstances we would suffer. This use of introspection is confirmed by common sense and universal consensus.

Even the most convinced defenders of behavioural psychiatry have to admit that in mood disorders, the feeling of grief felt by the patient is the first sign of depression. It is accepted as the first element pointing to that disease by the DSM-III-R ("depressed mood . . . as indicated by either subjective account or observation by others", "diminished interest or pleasure", fatigue, feeling of worthlessness, etc.) besides other disorders more specifically behavioural such as psychomotor agitation, retardation, variations of weight and so on. In the same way, in schizophrenia, the first sign of the disorder is the appearance of erratic ideas. Even if these elements are viewed from the angle of speech

patterns to the extent that we only know these disorders via language, we still have to admit that speech stems from internal data known by the patient only through introspection. Clearly, if the authors of this classification had been able to avoid using introspection, they would have done so. Elsewhere, I have documented a disorder usually due to bilateral lesions of the striato-pallidal formation which I have called "loss of self-activation" (Laplane, 1990). The external behaviour of these patients is characterized by hours of complete inactivity, even when not asleep they display lack of interest, of initiative, etc. This is very similar to the extreme slowdown of major depressions and even catatonia. Indeed, some of these patients with loss of self-activation were thought to be suffering from major depression or catatonia, sometimes from one, then the other. But there is an important difference between the patients suffering from major depression and those suffering from loss of psychic self-activation: the former brood over dark ideas and the latter brood over no idea at all. Questioned about their mental activity during their long hours of inactivity, they deny brewing dark ideas; they insist they are not bored. When pressed to describe what goes through their minds, they use words like emptiness, hollowness, lack, nothingness. One of them, when I insisted that one always thinks of something, answered: "Perhaps you do, Doctor, but I don't". The clinical pattern of these patients is therefore very specific, so long as you accept what they say they feel. It goes without saying that if these patients are believed, it is in large part because their words are confirmed by their general behaviour. In the same way, the finding of metabolic disorders in the frontal regions by the PET camera brings an additional objective argument. The data from introspection are con-

firmed by objective elements. This is an overt use of introspection open to anyone's criticism, but due to objective correlations, and also to a sort of trust in beings similar to ourselves, it will be taken into consideration in spite of the strangeness of severe disorders and the absence of any corresponding experience in the normal subject. Another obvious condition is to limit the introspection to very simple questions, contrary to those asked by introspective psychology which had hoped to see into the intimate development of behaviour processes. Some examples coming from scientific data however show a questionable use of introspection. We shall look first into the brain reward system, then into the burning question of interior language.

In the first case, what is missing is a clear introspective reference, which means that the interpretation of definite behavioural data is, to say the least, chancy. Everyone knows the early experiments by Olds and Milner (1954): an electrode, the discharges of which were controlled by a lever, was implanted into the brain of a rat, while the lever was settled in the cage for the rat's use. If the electrode was placed in the correct cerebral areas, the rat was seen to lean compulsively on the lever thus stimulating himself to the point of forgetting elementary functions, mating, eating or drinking, even leading, in some cases, to death. The authors immediately decided that the animal's behaviour was due to the "rewarding" effect of each of the discharges. The expression "reward" was used in order not to use the word "reinforcement" which deals with a slightly different order of things: "reinforcement" supposes a conditioning process whereas here, strictly speaking, there is not one. The choice of word is not, however, without any meaning. "Reiteration", for example, would have been totally neutral. Obviously, "reward" has some psychological introspective connotation with which we are all familiar. Many scientists have thought inwardly what journalists said aloud when they spoke of the pleasure electrodes. The journalists' naive expression has the merit of being honest and unequivocal. As a matter of fact, this type of experience does not refer to any introspective data, the assumed interpretation might be the right one, but we cannot be sure. Nothing tells us that the discharges bring about a reward which we cannot separate from a feeling of pleasure. Some patients with bilateral lesions of the basal ganglia, with or without the loss of auto-activation mentioned earlier, may show compulsive behaviour lasting up to several hours. Two of them could flick an electric switch on and off for 15 min at a time. When asked about it, they explained that they could not help it but did not draw any pleasure from it, except perhaps a lessening of anxiety. They realized that their behaviour was socially disturbing, and they would have liked to get rid of it. Are the two cases, the rats' and human beings', comparable? It is difficult to say. Experiments in man using self-stimulation do

exist and give some support to the usual interpretation. However, conclusions are far from clear. Animals and men during an experimental process are in a situation quite different from that of human beings suffering from spontaneous brain damage. But a similarity is not beyond possibility. If the traditional word "reward" corresponded to reality, it would not apply since the patients were not happy with their spectacular activities. To me, the issue does not seem in the least settled, but there seems to be sufficient doubt to suggest that we at least stop interpreting. The consequences are quite important: we should consider that the system responsible for the reiteration of the behaviour has to do not so much with the stimuli of conditioned reflexes, but rather with a break which would prevent a program once initiated from going on indefinitely.

A far more dangerous example of introspection, and the one which has had the greater influence on the evolution of philosophy and the neurosciences, deals with internal language and its relation to thought. The issue has been debated for centuries, even to the early years of this one. There cannot be thought without language, or so we are told. But what proof are we given? Sokolov (1972) wrote a long history on the ideas of the relation between thought and language. There are only *a priori* assumptions leaning either toward separation of the two or their amalgamation. Internal experience seems to have been the only foundation for these assumptions. One cannot think about anything without the mediation of an internal language. No one can deny the role of language in everyday life, especially when problems become difficult. One can reasonably deduce from this that, in the normal adult, language plays a major part in mental life. On the other hand, in favour of a relative independence of thought, many mathematicians presented advanced introspective data (given in answer to questions by the French mathematician J. Hadamard, 1975). But this impressive evidence is finally rejected as coming from subjective data. To Einstein's statement in favour of a thought without language is opposed Bohr's: "... no proper human thinking is imaginable without the use of concepts framed in some language which every generation has to learn anew". In the end, one subjective argument is just replaced by another one. The only objective argument is Piaget's in his studies of the differential development of thought and language. From his studies, Piaget formulates a theory that thought takes precedence in every case. It stems from sensorimotor acts; the only use of language is to structure the "thought-acts" and to socialize them. Sokolov's comments are typical: "It is true that thoughts cannot arise *ex nihilo* and that they presuppose manipulation of objects to be based on. But it is also quite evident that sensorimotor acts in themselves, without cooperation and formation of them in verbal acts (naming, classification, generalization, etc.), would never be able to lead the child

past the stage of the “sensorimotor intellect”. All that precedes makes the theory of genetic asynchronism of thought and speech rather artificial.” He might as well say that the young child approaches language without any organized thought What is this statement based upon? This time perhaps more on ideology than on introspection. For we know that Marx (quoted by Sokolov) wrote: “language is the immediate reality of thought”, and “ideas have no existence apart from language”. Anyway no supporting evidence is brought forward. Are we sure that in 1992, in our western world, ideology, that is to say pre-eminence of ideas over facts, is not still at work? In any case, we can but agree with Sokolov’s conclusion to his account: “The discussion so far makes it quite evident that the relation of language to thought is as yet unsolved. It is also evident that any further discussion may be made more fruitful if it is based on precise psychological and physiological investigations”. This is obviously the aim of his book. Unfortunately, the remainder of the work only manages to show the usual interpenetration of thought and language in normal persons although it points out some interesting facts, in particular that the so-called interior language is often translated into an electrical activity of the muscles of the floor of the mouth. I shall not discuss Sokolov’s book further, but must point out that the statement that thought and language are superimposed is still held as true in many contemporary writings without any proof other than the feeling of the philosopher or the scientist that he cannot think without words.

If we wish to make progress on the issue of the relation between language and thought, we must study pathological cases of apparent dissociation between language and thought. The most common cases are found in aphasia. In order to remain within the subject of this article, introspection, we shall talk only about auto-observations of aphasics who recovered well enough to be able to express what they remember of their aphasic episode. In a recent article (Laplaine, 1992), I reported and discussed such a case of auto-observation in a patient who had made her own migraine diagnosis and had decided on her own aspirin treatment while in the midst of an aphasic attack with massive loss of vocabulary, before any headache had started, in spite of the fact that she had never suffered from a similar attack before, but only ordinary migraines. Other auto-observations are known in the literature, but they have been little explored, probably from fear of critics in the scientific community which is supposed to be suspicious of any introspection even though the same community inadvertently makes use of it as I have tried to show. Worse, these auto-observations have had their most important parts omitted, doubtless when they did not fit in with the theme the writers wanted to develop (Alajouanine and Lhermitte, 1964). The best known of these auto-observations is Lordat’s because it is the oldest. It is also the

most naive in so far as it was published in 1843, when no one was interested in aphasia. Lordat was teaching at the Montpellier School of Medicine. By a rather extraordinary coincidence, Lordat had been interested in aphasia—which he called “alalia”, before he himself became an aphasic. With regard to the description of his aphasic troubles, the observation is of such precision and accuracy that it is not possible to doubt the auto-observation qualities of its author. What he most insists on is the integrity of thought, which he calls “the intimate feeling”, and he reproaches his predecessors for not having separated “loss of speech from loss of intelligence”. Here are the most significant extracts: “When I was awake and on my own, I talked wordlessly to myself of my life occupations, of my studies, so dear to me. I had no difficulty in exercising my power of thought. After years of teaching, I congratulated myself for being able to organise lessons, for not finding it difficult to change the order of my thoughts as it pleased me. The memory of principles, dogmas, abstract ideas was as when I was in health . . . but as soon as someone came to see me, I realised my disorder and the fact that I could not say: “Hello! How are you?”. And so I had to admit that the internal thinking could exist without words, that the embodiment of thoughts and their formation and combination were two different things. And so, while recognising the utility of language to conserve ideas, to stock them in archives and to transmit them, I could not agree to all Condillac said on the necessity, the indispensability (in italics in Lordat’s text) of verbal signs for thinking. When thinking about the Christian formula called doxology: Glory be to the Father, to the Son and to the Holy Ghost, etc. I felt that I knew all its ideas even though my memory could not suggest one word of it.” Quoting an 1834 philosophical article, Lordat writes: “They doubt that thought exists before speech. They say that speech is a prerequisite, but they are wrong They say they can’t think without using words. But I know, from my own experience, that it is possible to think, combine abstract things, without having any word to express them and without thinking about it in the least.” It is quite possible that Lordat had some illusions about the clarity of his own thinking, and he does not bring clear evidence of it; all the same, no one could doubt that he could dwell with ease in abstract spheres. Even if the quality of this exercise may be doubted, abstract thoughts can undeniably be called up without words. Personally, I have had religious patients who stated that never during their aphasic episodes had they lost their sense of God, an apparently abstract notion, or lost the ability to pray, although it was without words.

Another physician has left us his memoirs as an aphasic: Dr Saloz whose memoirs were reported and commented on by Naville (1918). The conclusions are essentially the same: “I had my thoughts, my ideas, my concepts”. To be honest, we have to admit that Saloz found them “perhaps a

little modified all the same; a little vague; I seem to remember that everything seemed a little woolly, a little cloudy, as in a dream or rather a nightmare; I did not know either if I had left for another world or what. At times, I had the impression of something like a veil weighing down on me and blurring my thoughts as when you dream with your eyes open; I had a distant feeling of *deja vu*". We must point out, however, that this observation does not contradict Lordat's, but leads one to think that Saloz's lesions were more extensive. The extent of Lordat's are unknown, but an autopsy was done on Saloz by Naville, and we know that the lesions were very extensive. There are many different aphasias and an even greater diversity of aphasics. It is unlikely that all aphasics keep the same ability for abstract thinking. What is important for the question of the relation between language and thought is that some do still retain it. Lordat is not the only witness in favour of the theory. Alexander, a Canadian philosopher, recently published his memoirs as an aphasic (1990). Like his predecessors, he notes that: "aphasics view themselves as the same people they were prior to the stroke, potentially as capable as before, and at first expect recognition of their responsible adulthood. They know they only lack the ability to communicate with language", and further down, this remark of very great importance: "For instance, I had a vivid concept of my wife in the ambulance but her name was forgotten; I had a concept of myself but my name was forgotten too; for 2 months I had a colorful concept of a specific Greek philosopher, but his name was forgotten." It can be assumed that for a professional philosopher, to have a "colorful concept of a Greek philosopher", is not merely to remember the facial features which have been attributed to him but indeed an idea of his philosophy.

Now, as in the early part of the century, introspection in cognitive psychology, interpreted by different observers, may lead to opposite conclusions. Some, the majority, leaning on so-called obviousness, based on their own experience or on a certain consensus amongst contemporary scientists, insist that language and thought are but one; others, a minority, but speaking from a personal experience worthy of consideration, come to an opposite conclusion. The weight of ideology is not negligible either. Joanne *et al.* (1991) questioned a number of aphasics and established that: "although aphasics lose to a variable degree the ability to use language, they seem nonetheless to be able to think functionally; if the one who said: 'I don't have any more words inside myself than outside . . . ' speaks the truth, it means that his thinking has to do with an interior language similar to that observed when trying to express himself outwardly. It is too easy then, therefore dangerous, to posit to a non-linguistic dimension to this kind of thinking. This rash statement etc. . . ." One does not quite see why an easy deduction has to be rash, nor why one should make things difficult rather than

simple, unless it is to answer an ideology so much part of oneself that it cannot be questioned. The evidence on which those who are less categorical may base themselves is at least as good as that of their opponents. There is a great difference however between the two types of experience which lead to these opposite conclusions: in the one case, the subjects are normal and in their experience language plays such an important role that it may seem exclusive; in the other case, pathology creates a cleavage between thought and language, which is not felt under normal conditions. This separation being accepted, there still would be, under normal conditions, a constant and close interaction between thought and language. It is clear that the specialization of each brain hemisphere would never have been shown if unilateral lesions, and more recently the cutting of the corpus callosum, had not allowed the separation of functions which we could not have imagined to be distinct from our own experience. For these reasons, the evidence for and against the separation of thought and language do not seem to have equal weights. I do not mean to say that sufficient proof of this separation has been yielded, but that there is enough evidence for seeking and examining the other arguments in favour of this theory. By other arguments I do not mean other introspective analyses such as Hadamard's book (1975) on invention in the field of mathematics, or Janson's contribution (1988). In spite of their undeniably high interest, they lend themselves to the same criticism as any introspection in the behavioural domain. They bring supplementary information as long as we are able to correlate them to others more objective. It is not the aim of this paper to explore these possible channels; we shall merely mention some: study of paraphasia in normal language and their influence on the comprehension of texts; influence of the context on the interpretation of texts; study of non-verbal behavioural abilities in aphasics, in children before language appears, in deaf-mutes, in animals, etc. . . . The symposium on thought without language held in 1988 (Weiskrantz, 1988) shows that the scientific community is ready to swing back toward the idea that there may well be thought without language. Philosophers will find it much harder to accept. It will remain to be determined whether this thought without language is infra-verbal—as many believe—or whether it is language's *raison d'être*, its meaning. A lot is at stake here, and this is probably the reason why ideologies have taken over from facts. We can see how, when so much is at stake, a non-identified but inadvertently used introspection can look like false evidence and change the orientation of a supposedly scientific argument.

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