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Telling what we know: describing inner experience

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It is claimed that psychological science can obtain accurate reports about people's inner experience. We reconsider three criticisms of introspection: Nisbett and Wilson's critical review of introspection, the failure of introspectionists to agree about imageless thought, and Skinner's behavioral position. We show that rather than dismissing introspection, these criticisms point the way towards technical improvements in the methods used to produce accurate descriptions of inner experience. One such method, Descriptive Experience Sampling, is described and used as an example to illustrate our conclusion that, although exploring inner experience is not trivially easy, it can provide important knowledge for many areas in cognitive science.

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There is a chasm in psychological science. On one side are those who think that describing inner experience is essentially impossible and unnecessary – methodological behaviorism, for example. On the other side are those who think that describing inner experience is trivially easy and vitally important – cognitive psychotherapy, for example (which rests on the question 'What were you thinking when…?'). Our opinion is that both sides contain an element of truth. We reconsider the arguments on both sides and show that for each it is possible to separate the kernel of truth from the chaff of overgeneralization and thereby to bridge the chasm. It is possible, but not trivially easy, to provide accurate descriptions of inner experience, and doing so will advance cognitive science.

Our opinion rests largely on our experience with a method designed to give descriptions of inner experience – Descriptive Experience Sampling (DES). It is not our intention in this brief discussion to convince the reader of the adequacy of DES or any other particular method. We have discussed the validity of DES reports elsewhere[1–3]. We have established the reliability between raters of one DES rating system[4] and have demonstrated the connection of inner experience to external behavior[1–3,5]. We will, however, use DES examples as illustrations, so we provide here a brief description of the method. DES uses a beeper to cue subjects, at random times, to pay immediate attention to their ongoing experience at the moment they heard the beep. They then jot down in a notebook the characteristics of that particular moment, and subsequently (within 24 hours) describe the characteristics of that sampled moment in an in-depth interview[1–3]. Those interviews ask only one question (although it is phrased in a wide variety of ways): '*What was occurring in your inner experience at the moment of the beep*?'

It should be said that, upon hearing of DES for the first time, many scientists (and most prospective subjects) simulate DES in thought by imagining wearing a beeper, hearing it beep, and responding to the question, 'What was I experiencing at the moment of the beep?' In such a simulation the only possible answer to that question is, 'I was wondering what my experience would have been had I been beeped right now', so DES seems impossible or at best trivially uninteresting. However, when they try the actual DES procedure, most subjects find that the beep easily 'catches experience in flight'. Why the discrepancy? In the actual DES procedure, a real beep comes from outside the subject and (with some training) serves as a practically immediate cue to pay attention to actual ongoing experience. In the simulation, the subject first pretends to create the cue and then pretends to respond to an experience that is pretended *not to include the creation of the cue*. The simulation simply does not mirror the actual DES procedure. Does the actual beep affect inner experience in some way? Of course. However, most subjects, including sophisticated subjects, report that the disruption is

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small and that it is possible to capture at least a substantial portion of the ongoing experience.

We are convinced that, with a few days of training and in the hands of a skilled questioner, most people can answer the DES question with ease and with substantial accuracy. Descriptions of inner experience given in answer to that question (assuming an adequate procedure) are no less believable than the descriptions of exterior experience given, for example, by a trusted friend who telephones on her mobile phone, says that she is standing in front of Buckingham Palace, and describes the details of what she's seeing.

To examine this opinion more fully, we first consider three positions that hold that exploring inner experience is impossible. For each position, we show that, although the essential criticism is fully justified, the criticism serves as a guide towards an adequate method of exploring inner experience rather than a categorical dismissal of such methods. We then cross to the other side of the chasm and consider positions, such as that of cognitive therapy, which hold that exploring inner experience is trivially easy – you just ask. Again, we show that the core of that position is also fully justified even though the assumption of methodological ease is erroneous.

'Nisbett and Wilson said it couldn't be done'

The first position that holds that exploring inner experience is impossible is attributed to Nisbett and Wilson, whose 1977 review examined studies in which participants gave causal attributions for their behavior[6]. Nisbett and Wilson observed that participants often said that their behavior was caused by mental events when, in fact, their behavior was the result of external manipulation. Nisbett and Wilson's conclusions were scathing and were very broadly written – perhaps overly so, in our opinion. For example, they wrote, 'The accuracy of subjective reports is so poor as to suggest than any introspective access that may exist is not sufficient to produce generally correct or reliable reports' (Ref. 6, p. 233). Critics of introspective-like methods have rallied around the Nisbett and Wilson article, often taking it to be an unconditional refutation of introspection in general, not merely of the attribution of causation.

However, it does not seem to be widely known that even Nisbett and Wilson recognized the possibility of accurate reports about inner experience:

> We also wish to acknowledge that the studies do not suffice to show that people *could never* be accurate about the processes involved. To do so would require ecologically meaningless but theoretically interesting procedures such as interrupting a process at the very moment it was occurring, alerting subjects to pay careful attention to their cognitive processes, coaching them in introspective procedures, and so on (Ref. 6, p. 246, italics in original).

Nisbett and Wilson's 'theoretically interesting procedure' is essentially a description of DES. Our opinion is therefore that Nisbett and Wilson were basically correct when they observed that people are often (or usually) substantially mistaken about inner experience. However, that position is often overgeneralized to imply that *all* people are *always* substantially mistaken about inner experience when, in fact, Nisbett and Wilson themselves had explicitly acknowledged that DES-type investigations might produce accurate reports. Thus, Nisbett and Wilson should be understood as contributing to knowledge about how to explore inner experience, namely that one adequate way might be to interrupt a process at the very moment it was occurring, to alert subjects to pay careful attention to their cognitive processes, and to coach them in introspective procedures.

'Introspectionists can't agree'

The second position that holds that exploring inner experience is impossible follows from the well-known dispute between German introspectionists (mostly in Würzburg) and American introspectionists (mainly E.B. Titchener at Cornell) about the existence of 'imageless thought'. Titchener held the view of sensationalism, that thinking without images is impossible: every 'experience has an elemental core and a meaning providing context. Perceptions have sensory cores and ideas have imaginal cores.'[7] However, the Würzburg introspectionists observed that some ideas had, apparently, no imaginal characteristics. They therefore concluded that they had discovered a new class of thinking, contrary to sensationalism, that they labeled imageless thought. Titchener disagreed, maintaining that imaginal cores always exist for all ideas, even though these imaginal cores are sometimes dim and difficult to apprehend.

After 20 years of introspective research designed to settle the controversy over whether imageless thought exists, neither side could claim unequivocal victory. This failure to agree about so fundamental an issue discredited introspection and was one of the reasons for a demise[8,9] so complete that the term 'introspection' rarely occurs in modern textbooks of psychology or psychological method (except as a historical reference to its use by structuralists during the earliest days of psychology).

However, Monson and Hurlburt reviewed the Würzburg and Cornell results and showed that the two factions '*did in fact agree with each other's reports of the phenomenon which was called imageless thought*' (Ref. 10, p. 20, italics in original). Subjects in both the Würzburg and the Cornell laboratories reported identical observations, namely the existence of 'vague and elusive processes, which carry as if in a nutshell the entire meaning of a situation…, such as "a realization that the division can be carried out without a remainder."' (Ref. 11, pp. 505–506). From the Würzburgers' theoretical perspective, these 'vague and elusive processes' were imageless thoughts; from Titchener's theoretical perspective, they were not.

Thus, as long as the two sides remained at the level of pure description, they were in perfect agreement:

'vague and elusive processes, which carry… meaning' exist. But when the two sides gave their theoretical interpretations of those observations, they differed dramatically. Therefore the imageless-thought debate should be understood as contributing to knowledge about how to explore inner experience: psychological science should discriminate strictly between the description of inner phenomena and the use of those descriptions in psychological theorizing.

'Skinner said that inner experience is impossible to examine'

The final position we consider that holds that exploring inner experience is impossible follows from a pervasive but incorrect belief that Skinner held private events to be nonexistent or unimportant. Actually, Skinner quite explicitly denied that position:

> The statement that behaviorists deny the existence of feelings, sensations, ideas, and other features of mental life needs a good deal of clarification. Methodological [non-Skinnerian] behaviorism and some versions of logical positivism ruled private events out of bounds because there could be no public agreement about their validity. Introspection could not be accepted as a scientific practice, and the psychology of people like Wilhelm Wundt and Edward B. Titchener was attacked accordingly. Radical [Skinnerian] behaviorism, however, takes a different line. It does not deny the possibility of self-observation or self-knowledge or its possible usefulness (Ref. 12, p. 16).

In fact, Skinner believed that private events have the same essential nature as public events:

> We need not suppose that events which take place within an organism's skin have special properties… A private event may be distinguished by its limited accessibility but not, so far as we know, by any special structure or nature. We have no reason to suppose that the stimulating effect of an inflamed tooth is essentially different from that of, say, a hot stove (Ref. 13, pp. 257–258).

However, Skinner did identify three main limitations on the scientific use of private events: (1) that verbal behavior about private events might be impoverished because it is difficult for the verbal community to shape a person's speech about inner experience; (2) that it is impossible for a person to have access to his or her thinking in its entirety; and (3) that it is a mistake to give causal significance to mentalistic events. All three criticisms are entirely justified, but the first is most important for our purposes.

According to Skinner, a main difference between private events (like toothaches or thoughts) and public events (like hot stoves) is that the community of speakers has more control over the speech about public events[13]:

> The verbal response 'red' is established as a discriminative operant by a community which reinforces the response when it is made in the presence of red stimuli and not otherwise. This can easily be done if the community and the individual both have access to red stimuli. It cannot be done if either the individual *or the community* is color-blind. The latter case resembles that in which a verbal response is based upon a private event, where, by definition, common access by both parties is impossible. How does the community present or withhold reinforcement appropriately in order to bring such a response as 'My tooth aches' under the control of appropriate stimulation? (Ref. 13, pp. 258–259, italics in original)

If a community wishes to develop a differentiated usage of the talk '*I see red*', it can give a series of trials in which it presents external objects that are variously rose, auburn, russet, rusty, carnation, strawberry, cerise and carmine, appropriately reinforcing or punishing talk about each specific variation of red. Thus, the community can shape '*I see red*' with great precision and thus can reliably differentiate such statements as '*I see auburn*' from '*I see cerise*'. However, if the community wishes to develop a differentiated usage of the talk '*I am depressed*', it *cannot* present a series of internal states that are variously melancholic, downcast, downhearted, droopy, low, blue, bummed out, and down. It therefore cannot directly reinforce or punish talk about such states. It is forced to rely on public accompaniments of private events, such as withdrawal, failure to eat, or crying, to shape statements about the private events themselves. Even though such public accompaniments may in fact be correlated with depression, those correlations are far from perfect. Therefore talk about the experience of depression receives only impoverished differential reinforcement and is not likely to have the same precision as talk about external events.

Differential reinforcement

Skinner's claim that private events receive impoverished differential reinforcement is exemplified with particular clarity in a previously unpublished aspect of our own DES research. With striking regularity, subjects early in their DES participation refer to their own inner experience as 'thinking', saying things like, '*At the moment of the beep I was thinking that I don't want to take that exam.*' The DES procedure carefully examines the details of such experiences. In fact, there is substantial variability from person to person in what is intended by the phrase '*I was thinking…*'. For example, when Alice says '*I was thinking…*' she means that she was saying something to herself, in her own naturally inflected inner voice. When Betty says '*I was thinking…*' she means that she was seeing a visual image of something. When Carol says '*I was thinking…*' she means that she was feeling some sensation in her heart or stomach, and that she had no awareness of cognition whatsoever. Over the course of the DES training, subjects learn to differentiate the talk about such experiences, but until that time, the verbal community simply has not

differentiated the term 'thinking' much beyond the fact that it pertains to a private event.

From this discussion, we suggest that Skinner should be understood as contributing to knowledge about how to explore inner experience: thus, we should limit ourselves to talk that has been adequately differentiated. Once subjects are trained in DES, they can report, for example, whether or not at any particular moment they were engaging in inner speech, precisely what words were being spoken at that moment, and the perceptual characteristics of that speech. That communication about inner experience can be shaped with the same level of precision as the communication about what you see at Buckingham Palace. However, it is far more difficult, if not impossible, to shape adequately such sentences as '*I am sad all the time*', an item from the most widely used depression inventory. Sampling frequently shows that individuals who endorse that item are sad at fewer than half their sampled moments; in fact usually they are not sad at more than half their sampled moments. It is thus simply wrong to believe that endorsement of that item should be understood as a description of inner experience. If we want to know whether someone is sad all the time, there is no substitute for collecting a large number of random samples and inquiring whether sadness is present at each sample.

'Accessing inner experience is easy – just ask'

We now turn to the other side of the chasm, the position that holds that exploring inner experience is easy. Cognitive therapy is based on the premise that people can give adequate answers to questions such as, '*What were you thinking when you*…?' or '*How do you feel when you*…?'

DES demonstrates that the assumption that people know the characteristics of their inner experience is usually, to at least some degree, untrue and often dramatically untrue. Hurlburt and Carl Sipprelle used the thought-sampling technique with an anxious individual, 'Donald'[2,3]. Sampling revealed that Donald had frequent angry thoughts about his children. Before sampling, the subject had no knowledge about this kind of thinking. Hurlburt showed that these 'angry-towards-children' thoughts were not unconscious but were in fact freely available at the moment of each sampling beep[3]. Donald simply characteristically neglected to remember the existence of these thoughts. Hurlburt also used DES with 'Fran', a woman suffering from borderline personality disorder, and discovered that she nearly always experienced multiple visual images, usually with extremely negative content[2,3]. Before sampling, Fran had no knowledge of the multiplicity of her visual awareness or its consistent negativity, despite the ubiquity of both characteristics.

Most DES subjects, whether diagnosed with a disorder or not, are surprised by some aspect of their sampling results. Thus, the cognitive therapy perspective exaggerates the ease of obtaining accurate inner reports. Nonetheless, it rests on the essentially true foundation that inner experience is important, and thereby contributes to knowledge about how to explore inner experience.

Conclusion

We have considered three anti-introspection criticisms and shown that each involves an overgeneralization that has been overlooked in the history of psychological science. We have refocused each position, showing that each provides valuable guidelines regarding how to gain access to inner experience. We concluded that the exploration of inner experience is neither impossible nor trivially easy, and that the three positions serve as valuable guides between those two extremes.

Explorations of inner experience have the potential to inform cognitive science, broadly defined. For example, DES research has found that some individuals have predominately visual images with no verbal content; others have frequent inner speech with no visual imagery; others usually experience cognition that contains neither images nor words, and still others have inner experience that almost never includes any form of conscious cognition at all. It is plausible that these kinds of individual differences will be related to many processes of interest to cognitive scientists – memory and reasoning, for example.

The DES method is clearly not the only avenue available for accurately exploring inner experience. For example, truly adept meditators in the Eastern tradition without doubt have a deeper and more accurate view of their experience than many non-meditators. However, the DES examples do establish, in our opinion, that most ordinary people can, with training that incorporates the critiques discussed here, accurately observe and report the features of their experience. Furthermore, the results of such explorations can be dramatically productive for cognitive science. It is our opinion that science should do more of them.

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