

Super siesta!

A nap in the afternoon could prevent information overload. That is the message from a study conducted by Sara Mednick and her colleagues at Harvard University's psychology department [Mednick, S.C. *et al.* (2002) *Nat. Neurosci.* 5, 677–681]. Mednick tested 139 undergraduates on a 'texture discrimination task', 4 times in 1 day. The students had to report the orientation of a target-array of bars presented very briefly against a background of horizontal bars. For each student, the length of time the target-array was visible was manipulated until they achieved 80% accuracy. Mednick found that with each testing session, the students needed more time to respond accurately, but that performance could be restored by a nap of 30 to 60 minutes between sessions. And the longer the nap the better: 60 minutes gave more time for slow-wave sleep, the crucial factor for restoration of performance. A rest without

sleeping did not help. Importantly, though, performance could be restored without sleep if stimuli were presented on the opposite side of the screen, suggesting that deterioration of performance was caused by region-specific loss of function in the brain, not general fatigue. So either have a nap after lunch or at least don't do the same thing all day; perhaps have a word with your boss about the afternoon timetable! *CBJ*

Harsh conditions make birds brainy

Living an easy life might not be such a good thing after all. A recent experiment has shown that birds that live in a harsh climate have bigger brains than those that enjoy a mild climate [Pravosudov, V.V. and Clayton, N.S. (2002) *Behavioural Neurosci.* 116, 515–522]. The researchers compared chickadees from two different areas, Alaska and Colorado, and their ability to

locate a previously hidden food cache. Alaskan chickadees were more efficient at finding their hidden supplies, suggesting that they had a better spatial memory. Analysing the birds' brains supported this hypothesis, showing that hippocampal formation was significantly larger in Alaskan chickadees. It would appear that the Alaskan chickadee has evolved specific brain properties to adapt to its harsh environment. As the human brain is similar to the bird brain at the cellular and sub-cellular level, this study might help us appreciate how our own brains change during learning and memory. *KR*

In Brief articles written by
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Letters

Debate on Introspection

Establishing a legitimate relationship with introspection

Response to Jack and Roepstorff

Psychologists' relationship with introspection is much like that between men and women: it is on again, off again and psychologists often feel they can neither live with introspection nor without it. In their often compelling article, Jack and Roepstorff argue that the fertility of the field depends on psychologists reuniting with the practice of introspection [1]. They suggest that, although reluctant to admit it, psychologists have been carrying on a surreptitious relationship with introspection that they should come clean and admit. Although mindful that challenges exist, Jack and Roepstorff suggest that psychologists can safely embrace introspection and spawn important new insights.

I am sympathetic to Jack and Roepstorff's attempt to mend the divisions

that have led many, though certainly not all, psychologists to spurn introspection. My discussion (pp. 339–344 in same issue) of the various ways in which people can fail to apprehend their own experience is not meant to undermine reconciliation between psychologists and introspection. To the contrary, by conceptualizing the manner in which introspection can be dissociated from experience, I hope we can anticipate potential rough spots in the relationship before unexpected difficulties further sour psychologist's trust in introspection. As in any relationship, trust necessarily depends on an understanding of differences.

When couples commit themselves to enduring relationships, they must recognize not only the anticipated pleasures but also the hardships. A danger for any relationship is the underestimation of the challenges that it faces. Although Jack and Roepstorff pay lip service to these challenges, their admonitions are insufficiently strong. They suggest, for example, that in order to apply introspective methods successfully, researchers '...need do scarcely more than read the rest of this [Jack and Roepstorff's]

article.' This, they argue, is because researchers '...are already highly familiar with the evidence.' This logic sounds dangerously close to Woody Allen's classic line that he is such a good lover 'because I practise a lot on my own'. One's own personal experiences, no matter how compelling they may seem, are a very dangerous proxy for those of others. How many relationships have suffered because one person presupposes that what is good for them must necessarily be good for their partner? It is a similar leap to assume that because researchers feel they can naturally introspect about their own experiences, that they should be similarly able to interpret the introspections of others.

Indeed it is questionable how confident researchers can be in their own introspections. One of the central implications of dissociations between consciousness and meta-consciousness is that individuals, presumably including researchers, can misrepresent their experiences to themselves. Jack and Roepstorff assert, '...there is also a sense in which subjects simply cannot be wrong about their own experiential states.'

Presumably they arrived at this conclusion by drawing on the seemingly self-evident quality of their own introspections, and assumed that it must equally apply to others. However, when we consider research on the topic, this conclusion seems less self-evident. If, for example, extensive introspection can cause people to make decisions that they later regret [2], then one very reasonable possibility is that the introspection caused them to 'lose touch with their feelings'. In short, empirical studies suggest that people can fail to appraise adequately (i.e. are wrong about) their own experiential states.

If researchers can neither have complete confidence in their own introspections nor those of their participants, then how do we insure a successful relationship between psychologists and introspection? Three strategies (also fundamental to sound personal relationships) seem important: identifying behaviors that establish credibility, finding common ground that enables mutual understanding, and developing a trust that allows one to know when to give the benefit of the doubt.

In relationships it is often said that 'actions speak louder than words'. This expression does not mean that words are unimportant but rather that they are only meaningful if validated by one's actions. Similarly, when people report strategies, feelings or beliefs, their accompanying behaviors must correspond with these statements if they are to be believed. If, as can happen, a person says that they prefer one item and then selects another [3], then our confidence in their account is shaken. Introspective credibility is also challenged when individuals say they used a strategy (e.g. deliberately moving an object) when they actually had no control [4]. Cases in which reflection alters (and particularly when it impairs) performance also raise questions about the accuracy of the reflections [2,5–8]. In short, when words and actions correspond we can have greater confidence in introspections than when they conflict.

Also central to any relationship is the establishment of common ground, helping to insure that both individuals see eye to eye. In the case of introspection, developing common ground can be achieved in various ways. By refining the use of language, individuals can be trained to consistently map particular expressions on to particular experiences.

Such linguistic training enables people to avoid the verbal overshadowing effects that translations of experience can otherwise produce [9]. Common ground can also be established between introspective reports and physiological measures. Jack and Roepstorff cite a study by Lutz *et al.* [10] in which subjects' categorizations of different perceptual experience consistently mapped on to unique EEG responses. Once such mappings have been established, then future introspections can be evaluated by assessing the degree to which self-reports co-occur with established associated physiological responses.

Perhaps the most critical element of any successful relationship is trust. This is certainly the case for psychologists and introspection, where demonstrations of questionable introspections [11] have undermined psychologists' willingness to rely upon this source of evidence. As in relationships however, it is important to have a theory about when to hold people at their word and when to shrug off their comments. We learn to disregard a partner's impetuous remarks after a difficult day, knowing that such comments often do not represent enduring feelings. Similarly, as we refine our understanding of when experiences are likely to become dissociated from meta-consciousness, we can increasingly predict when introspections are accurate and when they are suspect. As in human relationships, we must be aware of when it is appropriate to be suspicious and when we can trust introspection.

Needless to say, some psychologists will be unhappy about forging a relationship with introspection that requires the establishment of some trust. Just as finding a mate is not a necessity for everyone, we can certainly afford to have some researchers avoid embracing introspection. However, if the entire field spurned introspection, psychology would quickly become sterile. Given that many of us already tacitly rely upon introspection as a fertile source of inspiration and validation, we should formalize psychology's relationship with introspection and finally make it legitimate.

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The 'measurement problem' for experience: damaging flaw or intriguing puzzle?

Response to Schooler

Jonathan Schooler [1] aptly warns of the 'potential dangers of using self-reports as an index of consciousness.' He is absolutely right to do so, and his experimental work