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Introspection

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Introspection (etymologically, “looking inward”) refers to the ability to access one’s own mental life and the results thereof. It stands in contrast to perception, the ability to connect with the world, as well as to interoception and proprioception, which refer to the knowledge of the state of one’s organs and posture. In lay discourse and religious contexts, the capacity to reflect on one’s own thoughts is generally deemed uncontroversial. Introspection may be challenging at times, but the fact that it is difficult reinforces the notion that introspection is an actual faculty of the mind. Not so in cognitive science, in which, owing to a troubled history and to the fundamentally subjective nature of introspection, it has often been regarded as theoretically problematic and of little empirical importance. Yet, being able to access one’s own mental representations, states, and processes, and to report them, remains an interesting property of the human mind.

History

At the inception of scientific psychology in the late 19th century, introspection was considered the core tool for inquiry into the mind. Introspection was simply the observation method for the new empirical science. Interestingly, as ethnographers would publish manuals about field studies, advocates of introspection established guidelines for sound and rigorous “inner observations” ([Titchener, 1899](#)).

However, assigning a central role to introspection led to theoretical and empirical impasses. To counter the objection that the mental act of introspection would interfere with the mental phenomena under scrutiny, it was argued that introspection was not only an active self-reflective process but also a more passive registering of mental contents as they arose. This distinction led to the construal of consciousness as a field within which many conscious representations are simultaneously present, some being at the focus of attention, others at the fringes [see [Consciousness](#); [Higher-Order Theories of Consciousness](#)]. This way, the person doing the introspection can extend their attention on still-present mental contents dissociated from the introspective act of registering. However, this introduces a tight coupling between theory (the structure of consciousness) and method (introspection) [see [Self-Consciousness](#)]. This is problematic in modern empirical sciences, as though one could only measure temperature by accepting one particular theory of what heat is.

Empirically, reliance on introspection led to argumentative deadlocks. A classic illustration is the controversy about the existence of *imageless thoughts* (without a sensory component). Both sides agreed that the question was empirical but relied only on introspective evidence. The debate soon degenerated into a futile “my introspection against yours” standoff. The early psychologists who hoped that introspection could be made into a scientific method reluctantly discovered that modern science is based on the publicity of data. This realization led to the demise of the pure introspectionist paradigm in the 1920s (for the precise history, see [Danziger, 1980](#)).

The cognitive paradigm established in the 1950s dispenses with introspection as a method. Now, introspection could be studied as one faculty among many. Yet, the initial controversies that surrounded

the notion seemed to have tainted it. Well into the cognitive era, the distrust was yet again expressed in a paper by [Nisbett and Wilson \(1977\)](#) aptly titled, “Telling more than we can know.” Drawing on a range of experimental findings, they argued that people typically lack introspective access to the processes that generate their judgments and actions and instead produce plausible but inaccurate explanations based on post hoc rationalization. Introspection only reemerged as a legitimate field of inquiry in the early 2000s, in the wake of metacognition and consciousness studies.

Core concepts

In order to study introspection and its scope, limits, and properties, one needs to rely on *heterophenomenology*, that is, the use of subjective reports as data ([Dennett, 1991](#)). Although the inquiry method of heterophenomenology uses people’s subjective impressions and reports as data to be analyzed by the investigator, these reports are not to be taken at face value. Cognitive science can use subjective data but maintain a sharp distinction between them and the process of theory building. In fact, in the case of disagreement between first-person accounts of mental processes and the best third-person model of the mind built from neural and behavioral evidence, the consensus would always favor the third-person model as the ground truth about mental processes. Yet, the occurrence of a disagreement reveals an interesting property of introspection.

So conceived, introspection is but one facet of metacognition, or cognition about cognition [see [Metacognition](#)]. Metacognition encompasses both the monitoring of internal states and processes and their control. Introspection corresponds to the ability to express the results of metacognitive monitoring. Thus, introspection is the explicit component of metacognitive monitoring ([Shea et al., 2014](#)). Note that the communication of introspection is not necessarily verbal. For instance, macaque monkeys can be provided with the means of communicating their impression of seeing (as opposed to their ability to detect a stimulus) through the design of a task and its reinforcement structure ([Stoerig & Cowey, 1997](#)).

Among varieties of explicit metacognitive monitoring, the study of confidence judgments (that is, the question, “To what extent do people judge their decisions to be good decisions?”) is one of the most successful. A flurry of sophisticated experimental paradigms and theoretical models have been devoted to this question, leading to important discoveries, such as the neural basis of metacognitive monitoring in the anterior prefrontal cortex ([Fleming et al., 2010](#)), as well as fruitful avenues of research, such as domain generality of confidence judgments, whether the ability to accurately monitor one’s confidence predicts academic performance, or to what extent confidence judgments are specifically impaired in various psychiatric disorders (see [Fleming, 2021](#)).

Questions, controversies, and new developments

The success of the study of confidence judgments in perceptual decision-making has somewhat preempted the field of introspection studies. The reasons are clear enough; decision-making is a well-studied field ([Green & Swets, 1966](#)), providing a firm backdrop for the study of how people internally

assay the correctness of their decision, and confidence is a topic of interest in other fields (economics and forecasting, notably). However, human (and probably also other animal) introspective abilities extend beyond the correctness of their perceptual decisions. Indeed, elementary decision processes can be introspected at many stages before the final decision is reached ([Nelson & Narens, 1990](#); [Reyes & Sackur, 2014](#)). For instance, humans possess an ability to introspect intermediate subprocesses such as rehearsal processes in memory ([Kroll et al., 1975](#)), the orientation of attention during visual search ([Marti et al., 2015](#)), or attentional states ([Smallwood & Schooler, 2015](#)).

There remains a difficulty in reconciling the understanding of introspection at the cognitive level with discussions in social psychology. Since the seventies ([Nisbett & Wilson, 1977](#)), there has been a strand of research in social psychology highlighting the illusions of introspection ([Pronin et al., 2007](#)); people seem relatively blind to their own introspective failures while particularly sensitive to others' when making judgments about traits or dispositions (for instance, people judge others as conformist, yet explain their own similar behavior by appealing to reasons, suggesting a bias in introspective self-assessment). It remains to be ascertained whether introspection in the social psychology sense of self-knowledge and introspection on elementary cognitive processes form a continuum or not.

Broader connections

Insight in psychiatry (the ability to recognize one's disorder; [Beck et al., 2004](#)) and *anosognosia* in neuropsychology (lack of awareness of one's deficits; [Marcel et al., 2004](#)) are clinically significant forms of distorted introspection. Related disturbances include *alexithymia* (impoverished introspective access to affect) and perhaps even *depersonalization/derealization* (experiences of detachment from one's self or surroundings; [Sierra & David, 2011](#)), which could be framed as disruptions of introspective access to the self.

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