

striking because, from the listener's perspective, it represents a concatenation of two vocalizations, each meaningful on its own, into a larger meaningful utterance. In principle, a very large number of such combinations is possible, limited only by the size of the group. Among non-human species, such call combinations are rarely produced by a single individual; however, listeners in group-living primates confront them whenever they hear two animals vocalizing to one another.

A 'social origins' hypothesis for language

The results described here are consistent with a 'social origins' hypothesis, which argues that the internal representations of language meaning evolved partly from our pre-linguistic ancestors' knowledge of social relations [6–10]. Like modern monkeys and apes, our ancestors lived in groups with intricate networks of relationships that were simultaneously competitive and cooperative. The demands of social life created selective pressures for just the kind of complex, abstract, conceptual, and computational abilities that are likely to have preceded the earliest forms of linguistic communication.

Although baboons have concepts and acquire propositional information from other animals' vocalizations, they cannot articulate this information [11]. They understand dominance relations and matrilineal kinship but have no words for them. This suggests that the internal representation of many concepts, relations, and action sequences does not require language, and that language did not evolve because it was uniquely suited to representing thought [11–14].

Before the emergence of language, hominids assigned meaning to other individuals' calls and extracted rule-governed, propositional information from them. A crucial step in language evolution occurred when individuals came under strong selection pressure to communicate their thoughts, as opposed to simply extracting information from the calls of others.

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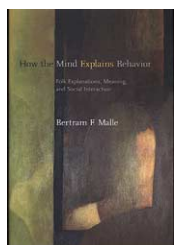
Book Reviews

Explaining explanations of behavior

How the Mind Explains Behavior by Bertram F. Malle. MIT Press, 2004. \$38.00/£24.95 (314 pp.) ISBN 0 262 13445 4

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When did the universe begin? How does a bird fly? These are perennial questions that have echoed through human history. But – let's face it – the eternal questions that figure much larger in our daily lives are more along the lines of: 'Why oh *why* did he do that?' and 'What could she possibly have been *thinking*'?

In a world full of other people, explaining human behavior is crucial. For those in the business of explaining behavior scientifically, it is just as crucial to examine the interpretive structures upon which behavior explanations are built. Bertram Malle's *How the Mind Explains Behavior* offers a model for the conceptual framework we use to sift and classify mental-state representations in order to select explanations about behavior. Although written mainly in the context of issues in the social psychology tradition, it would make enriching reading for

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anyone interested in the theoretical, philosophical, and experimental threads that stitch together our understanding of mental-state attribution.

A folk-conceptual framework

Social agents in psychology textbooks tend to resemble walking statistical software packages that perform feats like computing covariances between behaviors and the circumstances that prompt them. Malle's more sympathetic starting point is to view agents as entities that seek and create meaning from the interactions through which they navigate (e.g. [1]). He acknowledges that this search for meaning can operate in different ways and give rise to different types of explanation.

Explanations are generally considered to be at their best when they go from an effect (say, someone running away) to a cause (say, a bear galloping after them). Providing a meaningful behavior explanation involves linking the representation of a given behavior with background assumptions already in the explainer's mind. These background assumptions are 'collaborations' between biology and culture and form the core of a theoretical framework Malle calls 'folk-conceptual'. The framework is 'folk' because it seeks to capture the basis of explanations of behavior that people really apply in everyday life, and 'conceptual' because it deals with the representational content that gets funnelled into such explanations. Malle pragmatically sidelines debates over whether folk psychology is truly theoretical or whether it should be preferred to scientific psychological theories [2].

But what exactly are we citing when we assign a cause to purposeful, intentional behavior? Do we explain a joyful pirouette by appealing to the same class of causes that make a leaf twirl through the air? Malle endorses an approach to explanation in which *reasons* are not on the same explanatory footing as *causes* [3]. From the core of background assumptions, the explainer distinguishes between actions or events resulting from beliefs, desires, and intentions and those that come about from more mundane or unintentional causal antecedents. With this basic distinction comes a choice among different modes of explanation.

If the behavior in question is seen as unintentional – or there is not enough information available to classify it as intentional – the explainer will fall back on causal-type explanations that make no appeal to subjective mental states. A strength of Malle's framework is that when a behavior is perceived as intentional, the explainer is not limited solely to mentalistic explanations that invoke reasons. He or she can also call upon background factors that are not themselves reasons, as well as 'enabling' causes, such as skills and abilities, which presuppose an agent's reasons whilst explaining how it was possible that his intentions were carried out.

Explanations at large

Explanations, as Valerie Gray Hardcastle has noted, are social creatures [4]. One of the main purposes of Malle's framework is to account not only for how behavior explanations provide meaning for thirsty minds, but also how these explanations themselves are wielded as tools in the social milieu. To the extent that we are able to influence others' private explanations of our own behavior (sometimes a lot; other times, alas, woefully little), we can change their perceptions of it. Such 'impression management', Malle argues, stems from the same folk-conceptual framework that feeds behavior explanations. The proposition that explanations have such intimate uses in everyday life is one of the most intriguing facets of the book.

Many readers might ultimately find the book a bit too steeped in the social psychology tradition, especially if their interest is primarily at the level of psychological or neural implementation of social cognitive processes such as theory of mind [5]. Nevertheless, there is much scope for applying this framework in an interdisciplinary fashion. It also raises the dust on some prevailing notions – like that of a theory of mind as a relatively invariant, vested ability. If a child with autism cannot pass a false-belief task, for example, it might be worthwhile probing any fundamental differences in the explanatory strategies the child brings to bear on the situation.

Malle's mind is a recognizably cognitive one, coming to social interactions already fitted out with a set of variable, nested conceptual constructs. This mind is an intentional system, it has an evolutionary history, and has even had a cultural upbringing that forms and lends ontological status to its social categories [6]. So even though the behavior of the particular people in our lives might continue to puzzle us, Malle gives us hope that the way in which we attempt to answer those eternal questions about it – to explain the 'whys' and 'hows' of their behavior – is at least tractable.

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