

## Foreword: Pointing: where embodied cognition meets the symbolic mind

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# Foreword

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As this foreword is written, at the dawn of the 21st Century, the cognitive sciences are in epistemological ferment. The exuberant optimism of the late 20th-Century adaptationist programme has, itself, started to fragment like the many fingers of a wave against the implacable shore of empirical reality. Dramatic new directions in the philosophy of mind (enactivism, embodied cognition, distributed cognition) and in developmental psychology (dynamic systems theory) are beginning to mature. This special issue, *Pointing: Where Embodied Cognition meets the Symbolic Mind*, edited by Massimiliano Cappuccio, brings together in one volume an incendiary mix of the emerging generation of philosophers and language researchers, who bring their diverse perspectives to moor on one of the most fascinating phenomena in human development: the ability to co-orient in both space and time to a common focus with what seems, on the face of it, to be a simple pointing gesture. The emerging significance of research and analysis pertaining to pointing reflects a recent phase shift in the sciences concerned with mind and behaviour. To put these innovations in context, it might be worthwhile to review the sweeping upheavals that have recently occurred in the conceptual bedrocks of psychology and the philosophy of language.

The fact that all normal children acquire essentially comparable grammars of great complexity with remarkable rapidity suggests that human beings are somehow specially designed to do this, with data-handling or ‘hypothesis-formulating’ ability of unknown character and complexity (Chomsky, 1959, p. 57).

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In 1959, Noam Chomsky fired a salvo of criticisms against the extreme environmentalist dogma that pervaded the behavioural sciences at that time. One of the pillars of his argument was that there was insufficient regularity in the environments of developing children to account for the regularities in their ensuing speech. This is the argument later known as the poverty of the stimulus: the idea that there must be innate, universal human perceptual, even conceptual, mental processes that support our species-unique communicative behaviour. This notion, that the environments of developing children are too irregular to support the regularities manifest in the acquisition of speech, is one of the most influential ideas of the 20th Century, and it currently permeates theoretical development in the cognitive sciences and its philosophical foundations (see, e.g., Leudar & Costall, 2004).

But a battle is not won until your opponents concede the field. Historically, with respect to the core question of whether there could, in principle, be such a thing as an innate cognitive predisposition or a species-specific learning mechanism, this happened very quickly after Chomsky's (1959) critique of Skinner's *Verbal Behavior* (1957). The behaviourist doctrine of strong environmentalism fell after empirical observations by well-trained behaviourists (including Skinner's former students) of animals' species-specific behavioural traits that were impossible to extinguish (e.g., Bolles, 1970; Breland & Breland, 1961). For example, the Brelands, a husband-and-wife team of professional animal trainers, concluded that

[a]fter 14 years of continuous conditioning and observation of thousands of animals, it is our reluctant conclusion that the behavior of any species cannot be adequately understood, predicted, or controlled without knowledge of its instinctive patterns, evolutionary history, and ecological niche (Breland & Breland, 1961, p. 684).

Similarly, Bolles (e.g., 1970) demonstrated that rats displayed innate responses to aversive stimuli, arguing persuasively that animals in the wild did not have time to acquire escape responses through trial-and-error learning, because a single error in escaping a predator would be potentially fatal. Thus, these and other observations, by well-trained behaviourists (e.g., Garcia et al., 1955), conceded that, contrary to established theory (a) species did display innate patterns of learning and (b) that the learning environments of developing organisms were not the sole influence on these response patterns.

This opened the way to the modern adaptationist programme, in which two generations of cognitive scientists have laboured to identify the human species-specific cognitive adaptations that support our uniquely symbolic way of life. By 20 years ago, the popular science literature was communicating to lay audiences the fruits of the first generation of research under the adaptationist programme (e.g., Barkow et al., 1992; Bickerton, 1992; Corballis, 1992; Pinker, 1994). The field had arrived at a new dogma: humans had species-specific adaptations for representing others' minds, and representing those minds in language.

Under the auspices of these emerging nativist perspectives on human cognition and communication, pointing was viewed as one of these human species-specific adaptations. For example, Degos (2001) wrote that "[t]he pointing gesture is exclusively human, and universal within mankind" (p. 263) and Butterworth (2003) argued that ". . . human index-finger pointing is biologically based and species-specific" (p. 28). Similar views have been espoused by many leading researchers on gestural communication (e.g., Povinelli, Bering, & Giambrone, 2003; Tomasello, Carpenter, & Liszkowski, 2007). This simple perspective on pointing as a human species-specific gesture was severely challenged by experimental elicitations of pointing by animals: specifically, the great apes (e.g., Call and Tomasello, 1994; Leavens, Hopkins, & Bard, 1996). It is now empirically well-established that great apes, without any special training, either adopt or invent pointing gestures in captive circumstances (reviewed by Leavens & Bard, 2011), and pointing has recently been reported in such diverse species as monkeys (e.g., Kumashiro, Ishibashi, Itakura, & Iriki, 2002; Meunier, Prieur, & Vauclair, 2013, Mitchell & Anderson, 1997; Hess, Novak, & Povinelli, 1993), dolphins (Xitco, Gory, & Kuczak, 2001, 2004), and even birds (Kaplan, 2011). Given the spontaneous emergence of pointing in animals, it is clear that pointing is not simply a human species-specific gesture, and this fact has fanned significant theoretical diversity in its interpretation in recent years.

That pointing is not so simple can be readily discerned from a brief review of recent psychological and philosophical compendia on the subject. In 1995, Chris Moore and Philip Dunham published a collection of papers (*Joint Attention: Its Origins and Role in Development*) by virtually all of the leading developmental psychologists concerned with how human babies learn to follow their caregivers' gaze and pointing to visually fixate on a common focus, a state of intersubjective engagement known as "joint attention." The theoretical

significance of that landmark volume lay, in part, in the uneasy concatenations of papers by scientists with careers built on deep commitments to ontological presuppositions that were mutually contradictory from one chapter to the next. The book was a kaleidoscope of chapters grounded in theoretical commitments to nativist, representationalist, and environmentalist core assumptions and, as such, it fairly represented the diversity of mutually inconsistent worldviews on one of the earliest developing social capacities in our species. Thus, as recently as the mid-1990s there was a decided lack of unanimity on the nature of the processes that shaped human beings to jointly attend to common focus of attention.

Sotaro Kita (2003) later published a volume entitled: *Pointing: Where Language, Culture, and Cognition Meet*. Like the present special issue of *Humana.Mente*, this book was focused on pointing, one of the praxic foundations of the development and manifestation of joint attention in many cultures, worldwide. Unlike the Moore and Dunham (1995) volume, which was primarily concerned with the development of joint attention abilities, Kita's seminal book was catholic in its attention to the use of manual deixis across human cultures, and across the entirety of the lifespan. Contained within these pages was a profusion of disciplinary approaches to pointing, including developmental psychology, semiotics, psycholinguistics, comparative psychology, cross-cultural psychology, and anthropology, representing less an interdisciplinary synthesis than a cross-disciplinary collision of fundamentally different—yet pluralistically fruitful—points of view on the remarkable ability of humans to share both perceptual and conceptual entities. Reviewing the book, I commented that:

[f]ar from being the last word on pointing, this volume highlights both how little we really know about pointing and how extraordinarily many different kinds of research programmes can profitably study it (Leavens, 2004, p. 157).

This area of empirical inquiry is so rich, that every single chapter in that book will, I believe, form the basis of a productive research programme as the behavioural and language sciences mature.

Thus, the study of pointing is a productive and emerging area of empirical inquiry. Until recently, however, there has been no corresponding humanistic reflection of the state of the art in philosophical approaches to pointing. In

2005 developmental psychologists and philosophers contributed to an edited volume by Eilan, Hoerl, McCormack, & Roessler, *Joint Attention: Communication and Other Minds*, in which several impressive papers attempted to integrate emotional and cognitive development, followed by a series of philosophical papers concerned, in part, with the significance of joint attention for the creation of knowledge that is, somehow, shared among individuals. Late last year, Axel Seemann edited a unique volume on joint attention (*Joint Attention: New Developments in Psychology, Philosophy of Mind, and Social Neuroscience*, 2012) that also presented contributions from both empirical scientists and philosophers. This heady mix of science and humanism, yet again, reflects the sheer conceptual promiscuity of pointing—appealing to almost any social scientist or philosopher. As Watzl recently noted in his review of this book: “[t]he collection displays the liveliness of this research area. . . . and much research, both empirical as well as conceptual, remains to be done” (2012, para. 36; another review of this book appears in the present special issue, in the contribution by Dow).

That conceptual and empirical work continues right here, right now, in this special issue. This is the first time, to my knowledge, that philosophers have outnumbered empirical scientists in one collection concerned with pointing. This is an intoxicating blend of sophisticated conceptual analyses informed by the very leading edges of theoretical advances in related disciplines, such as evolutionary theory and the cognitive sciences. Whether the readers’ commitments lean towards representationalist or embodied approaches to manual deixis, there are papers here that will both resonate with and challenge those leanings. The diverse papers, here, are stunningly integrative, and conceptually sophisticated. In terms of the contributions that intersect with my own research expertise, in comparative and developmental psychology—Gonthier’s systematic application of her applied evolutionary epistemology to the relationship between pointing and language, Moore’s detailed analysis of the extracranial buttressing that pointing, in contrast to many other signals, requires, and Sultanescu and Andrews’s deft development of normativity and its application to nonhuman signals—I have been stimulated and provoked, in just about equal measure. I have found, in addition, much to consider in the, for me, less familiar research and conceptual arenas (Olney’s Peircean analysis of dog communication, the sundering of representational perspectives on pointing by Young, Kaufman, & Nanay, and the “ocularist,” neuroscientifically based analysis by Cappuccio, Chu, and Kita that emphasises

pointing as a co-variate of visual perception). The final papers in this special issue are concerned with a variety of processual or systematic concerns, including Meier and Lillo-Martin's conclusion that pointing's relation to symbolic language is reciprocally complex, Sparaci's intriguing analysis of atypical developmental trajectories in imperative and declarative communication of children with autism, Ulloa and George's review of the manifold social, neurological, and theoretical stances from which the comprehension of pointing and gaze can be analysed, and Baccarini's deconstruction and reconstitution of the visual dual-pathway model as applied to pointing. The issue finishes with Dow's aforementioned review of the aforementioned collection of papers on joint attention (Seemann, 2012), which constitutes a Janus-like looking back and looking forward to an embodied perspective on pointing in which—like Johnson's mighty stamp upon the rock in refutation of Berkeley's immaterialism—he decries the disembodiment of the inextricably embodied pointing gesture.

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