

Dueling Dualists

Commentary on Carpendale, Atwood, and Kettner

Michael Tomasello Malinda Carpenter

Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany

Key Words

Developmental psychology · Dualism · Pointing · Relational constructivism

Carpendale, Attwood, and Kettner (henceforth CAT) articulate two worldviews that underlie much research in developmental psychology. Their own worldview is called relational constructivism, and they contrast that with a worldview they called dualism (or cognitivism), which they attribute to us, among others. In the interest of theoretical, or meta-theoretical, balance, we would like to offer here our perspective on this dichotomy.

Individual Action

The dualism with which CAT are most concerned is that between mind (or mental states or cognitive processes) and behavior (or body). They argue against the view that mental states (or cognitive processes) are private and that they somehow underlie or structure observable behavior. Instead, they argue that “the starting point is activity, and mental states and observable behavior are both aspects of activity.”

But how does this “dual aspects” approach work in practice? Consider a child tugging at the lid of a bucket. What is she doing? Perhaps she is trying to pry loose the lid so she can play with it. Or perhaps she is trying to remove the lid so she can look inside the bucket. The whole point of a cognitive approach is that the exact same behavior – tugging at the lid – constitutes a different action depending on the goal of the actor. The goal is not directly observable, but it can be discerned by an observer given the right circumstances. Thus, if after removing the lid the child looks inside the bucket, then that was very likely her goal; whereas if the child removes the lid and plays with it – and does not look inside the bucket – then that was very likely her goal.

The alternative, we guess, is to say that the mental “aspect” of the activity was different in the two cases. But what does this really mean? Take a heating system reg-

ulated by a thermostat. One component of the thermostat is a dial for indicating the desired temperature. This is analogous (explicitly built to be analogous) to a human goal. The system also has a thermometer as a sensing device (analogous to human perceptual devices) to measure the temperature of the room – which can then be compared to the goal temperature to determine whether or not some heating action is necessary. The dial and the thermometer are not simply “aspects” of the heating system’s action of blowing hot air, they are actual components that determine its actions. Human goals and perceptions act in this same way, we would argue, as very real cognitive components helping to constitute and explain human action.

CAT invoke Piaget in several places, but Piaget is quite clear that mere behavior becomes action precisely when it is organized by some kind of underlying cognition. In analyzing the development of infants’ sensorimotor activities, for example, Piaget [1952] proposes a major shift when infants begin to differentiate behavioral means from internal goal state as end, so that the infant now has the goal state in mind ahead of time before initiating the action (stage 4). It is possible that CAT do not think of the goal as a mental state but rather an aspect of the action, but then what do they say when my goal is to maintain a situation just as it currently is, which at the moment requires no action at all? Thus, a shepherd may lie on the hillside doing nothing, but he most decidedly does have a goal, which becomes apparent the moment the sheep start to stray. How is that goal manifest in the shepherd’s action – that is, his non-action – if the sheep never stray at all? The point is that the goal is independent of the action and is part of the organization that is its formal cause, not its efficient cause.

Now what if we say that we know that the child’s goal in tugging at the lid of the bucket is to find the toy she left in there? And what if it was removed when she wasn’t looking? How do we explain her irrational action of searching for the toy where it isn’t? We (as well as most other human beings) would explain it by saying that she *believes* her toy is in the bucket. And so in this and other cases, in addition to the goal of finding the toy, the actor’s behavior is explained by her beliefs about the world. In the case of the thermostat, we would explain its performing a heating action even though the room is already warm by noting that the thermometer is somehow getting a false reading.

And so what we need to explain – both in our everyday lives and as scientists – is some kind of belief-desire psychology (or perception-goal psychology) that constitutes and explains an actor’s action. The case of the thermostat simply demonstrates that we are not talking about some supernatural “ghost in the machine” here, but simply the cognitive structuring – comprising a number of distinct components – that organizes the action and makes it what it is over and above surface behavior.

One final question about individual action is whether infants come to understand the actions of others through a process of simulation. Here CAT present only one version of simulation theory and attribute it to us. They attribute to us the view that infants reflect on their own experience and use that to analogize to others’ experience. But we are quite clear that we do not believe that reflective understanding of one’s own mental states is required for simulation. Instead, our view is simply that, for example, when the infant understands that someone “sees” something, all she knows about seeing is her own experience of seeing, and so that is what she takes the other to be doing. There is no reflection on her own mental states involved. Perhaps the confusion comes from our use of the word *analogy*, which CAT assume to require some kind of reflective awareness. That may be so, and perhaps we should not have used that word – although note that analogical reasoning is possible non-verbally: for

example, some monkeys are capable of it too [e.g., Fagot & Thompson, 2011]. Still, to be clear about it now, all we intend on the infant's part is a simple, unconscious recognition that these beings are like me in some sense and so *I* should expect them generally to behave/perceive/experience things like me. Infants may do this in much the same way that they categorize physical objects as alike and expect them to have similar properties without any conscious awareness or reflection.

The Case of Pointing

As a specific illustration of the difference that meta-theoretical assumptions can make in the practice of empirical research, CAT criticize our cognitivist theory of the early ontogeny of the human pointing gesture which claims, roughly, that when human infants are pointing they are attempting to influence the psychological states of others [Tomasello, 2008; Tomasello, Carpenter, & Liszkowski, 2007]. They propose instead that young children come to master the pointing gesture on a behavioral level only, through being shaped by adults. That is to say, they initially point as a kind of self-orientation to the things that interest them, and then various adult reactions to this action (e.g., responding to it by orienting themselves in the same direction) come to shape it into a meaningful communicative act [see also Kaye, 1982].

However, consider the case of informative pointing [Liszkowski, Carpenter, & Tomasello, 2008]. A 12-month-old infant is watching while an adult plays with two objects on a table. Then (in counterbalanced order across children) one of the objects falls off the table and the adult visually tracks it to the ground while the other object falls to the ground when she is not watching. The adult then looks back at the table, faces the child, and queries, "Where is it?" Infants preferentially point to the fallen object that the adult does not know about. One could of course posit some hypothetical learning history characteristic of almost all the children in the experiment (and for which there is no direct evidence) in which adults rewarded the infant for responding to a query by pointing to an object whose location they did not know, and did not reward them for pointing to one whose location they did know. (Still infants would have to figure out in later situations what type of situation it was – whether the adult knew or not!) Such fictional histories can always be created, and indeed behaviorists made a living doing it for many years.

But the natural interpretation of this experiment is that infants know that the adult would not query them about the location of an object whose location she already knew – that would make no sense – and so they inform her of the object about which she is ignorant. And there are several other studies with completely different methods that show similar understanding at similar ages, and for which a skeptic would have to create a different hypothetical learning history. For example, when 12-month-old infants observe an adult looking at an array of several objects and becoming excited about one of them, they conclude that it must be the one that the adult has not previously seen [Tomasello & Haberl, 2003]. In this case, we would have to posit a learning history in which infants were rewarded for giving to the adult not an object about which she is currently ignorant – she is not currently ignorant about any of them – but rather one which she had not seen in the past and is seeing now for the first time.

CAT are not behaviorists. But to preserve their cognitively minimalist approach, they end up having to rely on many of behaviorists' explanatory strategies in order to

account for the way that young children seem to communicate intelligently and appropriately with others depending on the circumstance, including the goals, expectations, and knowledge of the other person. In several places CAT propose that young children are able to do this because they are sensitive to “context.” But like *aspect*, the word *context* is not able to carry all of this theoretical weight without further specification, and that further specification in many cases is going to involve the cognitive processes – the goals, expectations, knowledge, and beliefs – of both the infant and the person with whom she is interacting. In some cases it will even involve the common ground they have with their communicative partner, as CAT acknowledge, and in all of the theoretical formulations of which we are aware common ground refers to an intersubjective interaction between two or more subjects of experience. Thus, if you learned of a terrible accident (and you think I didn’t) and I learned of it also (but I think you didn’t) then neither of us could say to the other, and expect them to understand, “*That* was terrible.” If we have just learned of it together, in contrast, the reference of the *that* is perfectly obvious. It is unclear to us how one could characterize intersubjectivity of this sort in a theoretical framework that restricts itself purposefully to non-mentalistic theoretical terms such as *aspects* and *contexts*.

Conclusion

Finally, we would like to comment on CAT’s theoretical position that “mind is explained as emerging within human social relations.” Provided that “mind” means “human mind” (i.e., its unique aspects relative to other primates), this is a claim with which we wholeheartedly agree, and indeed this has been a theoretical position we have championed for many years. Thus, Tomasello [1988, 2000, 2003] espouses the social-pragmatic view of language acquisition in which young children acquire a piece of conventional language by – and only by – jointly attending with a mature speaker to an intended referent. Tomasello [1999] goes so far as to claim that a child who grew up outside of any social interactions would as an adult have cognitive skills not very different from those of great apes. Tomasello and colleagues [Tomasello, Carpenter, Call, Behne, & Moll, 2005; Tomasello, Kruger, & Ratner, 1993] develop a theory in which young children socially construct all of their culturally specific skills – from making canoes to doing algebra – through cultural learning from pedagogical adults. And Tomasello [in press] explicates a theory in which such things as taking the perspective of others and self-reflection are socially constructed.

The difference between our and CAT’s view is how to characterize what is needed to engage in such a process of social construction. In our view, the key is what has been called the 9-month revolution, when infants begin doing a whole host of things that involve the appreciation of others as intentional or even cooperative agents, such as: intentional imitation, gaze following to distal targets, intentionally communicative pointing, joint attention, and collaboration. By the time infants begin engaging in such joint attentional activities they have typically had 8–12 months of social interaction and that surely contributes in many ways to the development of these abilities. However, as CAT recognize, highly specific social-interactive behaviors are unlikely to be the source for each of the different capacities involved because there is great similarity across infants within a given culture and also across infants in different cultures as to when and how these skills develop. Specifically, all of these different skills emerge as a

group in a very tight developmental window and a relatively predictable order in Western middle-class children [Carpenter, Nagell, & Tomasello, 1998]. And moreover, they emerge at roughly the same age even in cultures where parents do not routinely engage in any kind of shaping of their infant's behavior [Callaghan, Moll, Rakoczy, Warneken, Liszkowski, Behne, & Tomasello, 2011].

For social construction to occur, in our view, some unique cognitive tools are needed (i.e., beyond those of household pets who are treated by their owners as intentional, communicative agents but socially construct nothing). The skills and motivations for joint attention and shared intentionality, which first emerge at around 9 months of age, fulfill exactly this need. They enable young children to engage with adults in ways that make the social construction process possible. Of particular importance – as Mead [1934] and CAT both emphasize – are the intentionally communicative interactions that infants have with mature members of their culture, in which the interactants seek to establish joint attention and common ground about the situation in which they are currently interacting.

We thus share with CAT many theoretical and meta-theoretical assumptions, in particular the key role of interaction, including socio-communicative interaction, in children's coming to understand the world – assumptions with which many neoneativists would very likely disagree. We thus believe that attempting to specify both similarities and differences between different interaction-oriented approaches, as CAT have done, is a very helpful enterprise for the field, and we hope that we have contributed further to this enterprise in our response.

References

- Callaghan, T., Moll, H., Rakoczy, H., Warneken, F., Liszkowski, U., Behne, T., & Tomasello, M. (2011). Early social cognition in three cultural contexts. *Monographs of the Society for Research in Child Development*, 76, vii–viii, 1–142.
- Carpenter, M., Nagell, K., & Tomasello, M. (1998). Social cognition, joint attention, and communicative competence from 9 to 15 months of age. *Monographs of the Society for Research in Child Development*, 63, i–vi, 1–143.
- Fagot, J., & Thompson, R.K.R. (2011). Generalized relational matching by guinea baboons (*Papio papio*) in two-by-two-item analogy problems. *Psychological Science*, 22, 1304–1309.
- Kaye, K. (1982). *The mental and social life of babies: How parents create persons*. Chicago: University of Chicago Press.
- Liszkowski, U., Carpenter, M., & Tomasello, M. (2008). Twelve-month-olds communicate helpfully and appropriately for knowledgeable and ignorant partners. *Cognition*, 108, 732–739.
- Mead, G.H. (1934). *Mind, self and society*. Chicago: University of Chicago Press.
- Piaget, J. (1952). *The origins of intelligence in children*. New York: Basic Books.
- Tomasello, M. (1988). The role of joint attentional process in early language development. *Language Sciences*, 10, 69–88.
- Tomasello, M. (1999). *The cultural origins of human cognition*. Cambridge: Harvard University Press.
- Tomasello, M. (2000). The social-pragmatic theory of word learning. *Pragmatics*, 10, 401–414.
- Tomasello, M. (2003). *Constructing a language: A usage-based theory of language acquisition*. Cambridge: Harvard University Press.
- Tomasello, M. (2008). *Origins of human communication*. Cambridge: MIT Press.
- Tomasello, M. (in press). *A natural history of human thinking*. Cambridge: Harvard University Press.
- Tomasello, M., Carpenter, M., Call, J., Behne, T., & Moll, H. (2005). Understanding and sharing intentions: The origins of cultural cognition. *Behavioral and Brain Sciences*, 28, 675–735.
- Tomasello, M., Carpenter, M., & Liszkowski, U. (2007). A new look at infant pointing. *Child Development*, 78, 705–722.
- Tomasello, M., & Haberl, K. (2003). Understanding attention: 12- and 18-month-olds know what's new for other persons. *Developmental Psychology*, 39, 906–912.
- Tomasello, M., Kruger, A., & Ratner, H. (1993). Cultural learning. *Behavioral and Brain Sciences*, 16, 495–552.