

# EVENT COGNITION

Organized by Alan Costall and Ad Smitsman

## **Introduction: Michotte Reassessed**

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Michotte's research on the perception of causality is widely acknowledged as a significant contribution to the study of event cognition. Yet important aspects of Michotte's later work have been neglected or misunderstood:

1. Although Michotte's experimental methods have been dismissed as seriously flawed, many of the criticisms beg the theoretical questions his research sought to address.
2. Michotte's researches were not restricted to causality, but included tool use, object permanence and identity, social perception and emotional expression, the perception of pictures and film, 'phenomenal reality', and the experience of agency and personal identity (see Thinès, Costall, & Butterworth, 1991).
3. Michotte himself denied any direct philosophical implications of his work, yet his research was devoted to fundamental, metaphysical themes. To a remarkable extent, his research career can be understood as an attempt to turn experimental psychology against the positivism of modern science.
4. Michotte's claim that events can be perceived was not a denial of the involvement of the 'higher mental functions'. Some events, he insisted, are 'directly lived', but others can only be inferred. And, as our experience of conjuring shows and other illusions reveal, we do not always believe what we see.

### **Reference**

Thinès, G., Costall, A., & Butterworth, G. (1991). *Michotte's experimental phenomenology of perception*. Hillsdale, NJ: Erlbaum.

## **Studying the Perception of Naturally Constrained Dynamic Events**

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Analytically, planar collisions may be among the simpler dynamic events occurring in the environment. They are also perhaps the simplest to provide kinematic information about dynamic properties such as mass and elasticity. Yet, difficulties are encountered in studying them experimentally as soon as one seeks not just to gauge the level of perceptual performance but also to answer specific *what* and *how* questions concerning the informative properties actually used in perceiving. Standard experimental procedures get confounded because the necessary dynamic constraints prevent the direct independent manipulation of the variables in terms of which the desired explanation, the characterization of perceptual functioning, is to be couched.

It will be argued that methodological concerns of this sort pertain fundamentally to all studies of perception-as-based-on-specificational-information. The discussion will occur in conjunction with a presentation of some experimental studies of the perception of collisions, pertaining to issues such as the role of pre-collision kinematics and direct vs. indirect (heuristic) use of information.

## **Visual Perception of Support Surface Rigidity and Length from Kinematic Displays**

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The utility of postural control strategies is influenced by support surface dynamics. Accordingly, animals must perceive dynamic properties of the surface of support in order to control stance adequately. Riccio and Stoffregen (1988) claim that support surface dynamics should be perceivable solely on the basis of the kinematics of the body during interactions with a surface (e.g., standing sway). Body kinematics are available to the behaving animal through somatosensory stimulation (and others). However, these kinematics also structure light: That is, body motions can be seen by outside observers. This leads to the hypothesis that observers may be able to perceive the dynamics of an invisible surface of support simply by seeing its influence on the body kinematics of another person interacting with it. We made point-light displays of an actor on three surfaces that differ in their rigidity and length (a mattress, a balance beam, and the floor). Observers were able to differentiate these surfaces when the actor bent over to touch his toes, but not when he engaged in large amplitude sways at the hips. By changing the number (and hence the pattern) of lights on the actor we will attempt to identify the locus of the information that supports this ability.

### **Reference**

Riccio, G. E., & Stoffregen, T. A. (1988). Affordances as constraints on the control of stance. *Human Movement Science*, 7, 265-300.

## **Tool-Use in Infancy: Perception of a Higher-Order Affordance**

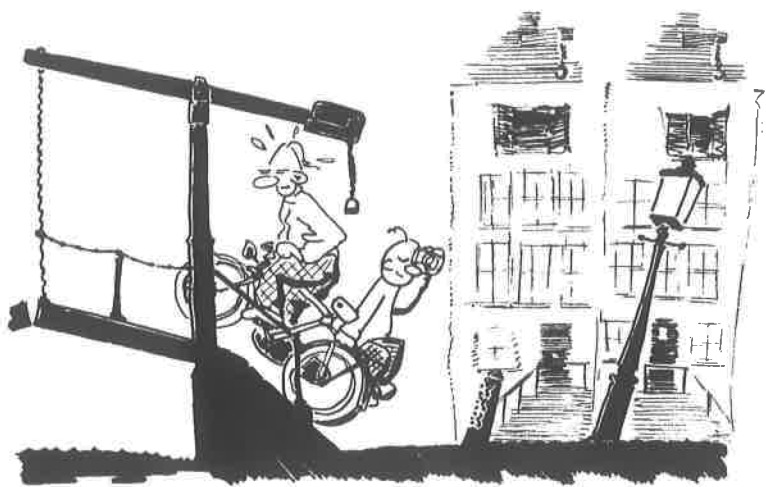
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Following the approach of ecological realism we argue that perceiving an object as a tool requires anticipation of several mutually constraining affordances. These include what the tool affords to the actor, what the tool affords to a target object, and what the target affords the actor. The integration of several affordances itself is argued to be a higher-order affordance.

The necessity to anticipate mutual constraints between complementary relationships could explain why tool-use is occurring at a relatively late stage of development, where children already possess certain motoric abilities required for tool-use. This is consistent with our view that perceptual rather than motoric capacities are expected to be the bottleneck in solving tool-use tasks.

On the basis of a recursive definition of the higher-order affordance concept, the difficulty of perceiving the function of a tool could be determined from the degree of integration of the affordances involved in perceiving the function of a tool in a configuration of objects. Predictions were tested in preliminary experiments. Children aged between 12 months and 7 years were observed in a classical tool-use task going back to Köhler (1921), in which a desirable target has to be brought within reach through using a hook as a tool. By varying the relative position of the hook and the target, the difficulty of perceiving the tool function of the hook was shown to be more adequately predicted from our criteria than from alternative criteria derived from, among others, the received view that spatial contact between tool and target facilitates the perception of the tool.



PERCEPTION & ACTION CYCLE