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News From the Field

PERCEPTION AND ACTION

Going With the Optic Flow

Bruggeman & Warren (2010). The direction of walking—but not throwing or kicking—is adapted by optic flow. *Psychol Sci*, **21**, 1006.

As we walk through our environment, our visual world flows past, providing a rich source of information about the direction we are headed in. For example, imagine you are hurrying to exit an auditorium through a particular door. As you move toward your goal, your view of the textured features of the room—the floor, ceiling, and seating—move by in a very particular pattern that is specific to the direction in which you are heading. Bruggeman and Warren found that optic flow is used to calibrate the direction of movement when walking to a target, but not when throwing or kicking a ball to the same target. During an adaptation phase, participants were asked to walk to targets in a textured virtual environment in which the simulated direction of travel was 10º to the left or right of the actual direction of walking. Participants readily adapted to the displaced optic flow patterns by recalibrating their initial walking direction. During pretest and posttest, participants were presented with normal optic flow containing no displacement and were asked either to throw or kick a ball to a target or to initiate walking to the target. For all three motor tasks at pretest, the directions of walking, throwing, and kicking were quite accurate. At posttest, however, walking direction showed a clear adaptation aftereffect; participants initially walked in the direction opposite the adapted optic flow displacement, reflecting their learning during the adaptation phase. Despite this evidence for the recalibration of walking, the participants showed no adaptation aftereffect for kicking and throwing. The adaptation to walking direction did not appear to alter the visual perception of "straight ahead," but rather recalibrated the mapping between the visual and the locomotor direction. Perceptual–motor calibration based on optic flow was functionally task-specific, transferring to locomotor but not to other types of motor tasks. —L.C.N.

TIME PERCEPTION

The Limitations of Precise Timing Judgments

Brenner & Smeets (2010). How well can people judge when something happened? *Vis Res*, **50**, 1101.

Why is it that when we have to make explicit simultaneity or temporal order judgments based on visual information, we perform rather poorly, but with interception tasks in which we have to act on a moving object, such as when we have to hit a moving ball with a bat, we are quite good? Brenner and Smeets explored this question in a series of experiments. One possible answer is that high-precision temporal judgments are obtained when observers can utilize motion information, for instance when judging the direction of apparent motion rather than the temporal order or judging the absence of motion signals rather than simultaneity. This possibility is supported by the fact that temporal order judgments are considerably better when the separation between the stimuli is small, allowing for better judgment of motion direction. If this possibility is viable, judgments of simultaneity should be interrupted by the presence of irrelevant motion. In their first experiment, Brenner and Smeets found that irrelevant motion disrupted observers' ability to match a color change occurring in two objects, and this harmful effect increased with increasing velocity.

Another possibility is that in interception tasks, observers can predict the exact moment of interception because they constantly see the moving object as it approaches the point of contact, but in typical tasks of explicit timing judgment, the stimuli are brief and involve an abrupt change that does not allow for such prediction. Brenner and Smeets's second experiment tested whether the ability to make precise timing judgments—in order to synchronize the color change of two objects—depends on the ability to anticipate when the change would take place. Observers saw two or three rectangles that seemed to rotate in depth in various directions. The rectangles changed color at some point in time, and the observers were asked to synchronize that color change. In some of the conditions, the moment of the change was predictable—it always occurred at a specific degree of rotation (e.g., always occurred when the rectangles were orthogonal to the screen). In the other conditions, the angle at which the color change occurred varied in either direction along the path of rotation. The findings, however, did not support the hypothesis that predictability is an important factor for timing judgment. The ability of the observers to synchronize the color change was not better when the angle of rotation at the time of change was constant; instead, performance was optimal when the rectangles changed color when oriented in the frontal plane, suggesting that performance was mediated by apparent motion, because in this condition the rectangles' images were largest at the moment of change and their edges were moving most slowly.

A third and final experiment confirmed that it is hard to make precise timing judgments for stimuli that have different durations but similar intensities. The outcomes of the experiments led Brenner and Smeets to suggest that we do not have specialized mechanisms for explicit tem-