markable is how little experience is needed with a dynamic point-light display.

CONCLUSION

Experimental psychology has largely ignored the dimension of time in the stimulus (Jones, 1976). In vision, for example, we have typically tried to stop time, slicing it finer and finer with the tachistoscope. Such snapshots of the visual processing system can reveal many kinds of operations, and their usefulness should not be undervalued. Nevertheless, they remain static views of a fundamentally dynamic system. Over the past 15 years, the application of information-processing techniques to vision has introduced time into the experimental situation, but in an incomplete fashion. Time is taken to be a variable pertinent to the perceiver but not to the stimulus. For example, a brief stimulus may be presented, then masked after an intervening interval so as to disrupt perception in the viewer. But the stimulus is still a snapshot, and very few snapshots appear in our world except on the printed page. A testament to their pecularity is that as pictures the perception of these flat images must be learned (Kennedy, 1974), whereas the perception of movement appears innate. Movement, of course, occurs over time.

According to conventional wisdom, the perception of moving shapes is derived from the perception of static forms. That is, movement is thought to be impleted, or compiled, from snapshots, much as the continuity in film is compiled from its separate frames. The study of apparent movement can be interpreted as a case in point, where geometric forms can appear to move and change shape between stimulus presentations (see Kolers & Pomerantz, 1971). However, the perception of dynamic forms is probably not derived from the perception of static forms. Instead the logic of their relation might be reversed: Static form perception can be viewed as a special case of dynamic form perception where the transformationally invariant information is held null (Pittenger & Shaw, 1975a). This new position easily leads one away from the study of stimuli at a given time and toward the study of events over time. Walking is one such event.

Johansson (1973, 1975) has demonstrated that a dynamic array of point lights is sufficient to recognize the presence of a walker. Our study goes further, demonstrating that the same array is sufficient for the recognition of a *particular* walker. Static or very brief presentations are insufficient. For example, Johansson (1976) has demonstrated that 100-msec presentations of dynamic point-light displays cannot be recognized as people walking or running, whereas slightly longer displays are entirely adequate. Preliminary results of our own corroborate Johansson's findings.

The primary advantage of Johansson's technique is that it is both manageable and naturalistic. With it one can achieve experimental rigor and still deal with common, everyday events. Like others, we think that these are the events that psychologists should study.

REFERENCES

BÖRJESSON, E., & VON HOFSTEN, C. Visual perception of motion in depth: Application of a vector model to three-dot motion patterns. *Perception & Psychophysics*, 1973, **13**, 169-179.

GIBSON, J. J. *Perception of the visual world*. New York: Houghton Mifflin, 1950.

JOHANSSON, G. Visual perception of biological motion and a model for its analysis. *Perception & Psychophysics*, 1973, **14**, 201-211.

JOHANSSON, G. Visual motion perception. *Scientific American*, 1975, **232** (6), 76-89.

JOHANSSON, G. Spatio-temporal differentiation and integration in visual motion perception. *Psychological Research*, 1976, **38**, 379-393.

JOHANSSON, G., & JANSSON, G. J. Perceived rotary motion from changes in a straight line. *Perception & Psychophysics*, 1968, **4**, 165-170.

JONES, M. R. Time, our lost dimension: Toward a new theory of perception, attention, and memory. *Psychological Review*, 1976, **83**, 323-355.

KENNEDY, J. M. *A psychology of picture perception*. San Francisco: Jossey-Bass, 1974.

KOLERS, P. A., & POMERANTZ, J. R. Figural change in apparent motion. *Journal of Experimental Psychology*, 1971, **87**, 99-108.

MAAS, J. B., & JOHANSSON, G. *Motion perception I: 2-dimensional motion perception*. Boston: Houghton Mifflin, 1971 (film). (a)

MAAS, J. B., & JOHANSSON, G. *Motion perception II: 3-dimensional motion perception*. Boston: Houghton Mifflin, 1971 (film). (b)

PITTENGER, J. B., & SHAW, R. E. Aging faces as viscal-elastic events: Implications for a theory of nonrigid shape perception. *Journal of Experimental Psychology: Human Perception and Performance*, 1975, **1**, 374-382. (a)

PITTENGER, J. B., & SHAW, R. E. Perception of relative and absolute age in facial photographs. *Perception & Psychophysics*, 1975, **18**, 137-143. (b)

SHAW, R. E., & MCINTYRE, M. Algoristic foundations to cognitive psychology. In W. B. Weimer & D. S. Palermo (Eds.), *Cognition and the symbolic processes*. Hillsdale, N.J: Erlbaum, 1974.

SHAW, R. E., MCINTYRE, M., & MACE, W. M. The role of symmetry in event perception. In R. B. MacLeod & H. L. Pick (Eds.), *Perception: Essays in honor of J. J. Gibson*. Ithaca, N.Y: Cornell University Press, 1974.

WOLFF, W. *The expression of personality*. New York: Harper, 1943.

(Received for publication December 23, 1976.)