P. Thompson[1] and L.S. Stone[2].

[1] Department of Psychology
University of York York YO1 5DD UK

[2] Flight Management & Human Factors Division
NASA-Ames Research Center Moffett Field CA94035-1000 USA

We compared speed matches for pairs of stimuli that moved in opposite directions (upward and downward). Stimuli were elliptical patches (2 deg horizontally by 1 deg vertically) of horizontal sinusoidal gratings of spatial frequency 2 cycles/deg. Two sequential 380 msec foveal presentations were compared. One of each pair of gratings (the standard) moved at 4 Hz (2 deg/sec), the other (the test) moved at a rate determined by a simple up-down staircase. The point of subjectively equal speed was calculated from the average of the last eight reversals. The task was to fixate a central point and to determine which one of the pair appeared to move faster. Eight of 10 observers perceived the upward drifting grating as moving faster than a grating moving downward but otherwise identical. On average (N = 10), when the standard moved downward, it was matched by a test moving upward at 94.7 +/-1.7(SE)% of the standard speed, and when the standard moved upward it was matched by a test moving downward at 105.1 +/-2.3(SE)% of the standard speed.

Extending this paradigm over a range of spatial (1.5 to 13.5 c/d) and temporal (1.5 to 13.5 Hz) frequencies, preliminary results (N = 4) suggest that, under the conditions of our experiment, upward motion is seen as faster than downward for speeds greater than ~1 deg/sec, but the effect appears to reverse at speeds below ~1 deg/sec with downward motion perceived as faster. Given that an up-down asymmetry has been observed for the optokinetic response (van den Berg & Collewijn, 1988; Murasugi & Howard, 1989), both perceptual and oculomotor contributions to this phenomenon deserve exploration.

Key words: Motion Speed Optokinetic response