Perception of animacy and direction from point-light displays

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Directional information can be extracted from upright scrambled point-light displays that are devoid of all structural cues prompting the suggestion of a distinct local mechanism in biological motion perception that may serve as a “life detector” (Troje & Westhoff, 2006). Whether the proposed mechanism conveys information beyond direction is unknown. We present three experiments that investigated the perception of both animacy and direction from point-light stimuli. Coherent and scrambled point-light displays of humans, cats, and pigeons that were upright or inverted were embedded in a random dot mask and presented in sagittal view to three groups of naïve observers. Observers assessed the animacy of the walker on a six-point Likert scale in Experiment 1, discriminated the direction of walking in Experiment 2, and completed both the animacy rating and direction discrimination tasks in Experiment 3. Stimulus duration varied from 200 – 1000 ms across blocks in Experiments 1 and 2, and was fixed at 500 ms in Experiment 3. Coherent stimuli appeared more animate than scrambled stimuli and inversion decreased animacy ratings, although more substantially for coherent than for scrambled walkers. Similarly, discrimination accuracies were higher for coherent versus scrambled stimuli and inversion decreased performance, but more substantially for coherent than for scrambled walkers. Both animacy ratings and discrimination accuracies did not differ for animal type or stimulus duration. Experiment 3 showed further, a linear correlation between animacy ratings and discrimination accuracies. The results indicate that like the ability to discriminate direction, the perception of animacy from scrambled displays is orientation-specific. The linear relationship between the animacy and direction data suggests that they address a similar mechanism within our context. We propose that the responsible mechanism uses a dynamic, gravity-dependent framework to interpret terrestrial articulated locomotion and is remarkably robust, operating efficiently at limited exposure times.