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Critical temporal windows for natural point-light gender discrimination.

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There is a growing body of literature investigating point-light biological motion perception. Based solely on the kinematics of a handful of dots representing the body and major joints of a human actor, observers can extract complex information such as gender from point-light displays. Many previous studies have used artificially generated point-light animations to investigate critical features for gender discrimination (Cutting, 1978; Mather & Murdoch, 1994). Here we investigate the diagnostic cues for gender discrimination of natural point-light walkers using a technique similar to temporal "bubbles" (Thurman & Grossman, 2007), an adaptation of the "bubbles" technique (Gosselin & Schyns, 2001). We presented three full cycles of a point-light walker, randomly chosen from a set of 25 male and 25 female actors (Troje, 2002), while observers made forced-choice gender discriminations. On each trial, we removed a randomly chosen subset of frames from the animation and assessed performance as a function of frames present and absent. We reason that performance is best when a non-critical interval is removed, but declines when a critical interval is removed. Hence, our experiment identifies the temporal windows and diagnostic features that most often lead to a correct gender discrimination. Preliminary results suggest that hip sway, as reflected by the distance between the hip dots over time in the profile view, is a primary critical feature for discriminating gender in natural point-light displays. This result is consistent with previous studies using artificially generated point-light animations (Barclay et al., 1978; Cutting 1978). This interpretation is supported by the observation that male walkers in our data set with high levels of hip movement are consistently misclassified as female, and that females with low hip movement are typically misclassified as male.