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Title: EEG dynamics associated with reaching for targets
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Subjects sitting in darkness reached forward with their extended right index finger to touch an illuminated LED in one of three 3D positions (left, center, and right, and varying in distance and elevation from the subject's shoulder). Reaches were made from one of two initial starting postures, forearm vertical against shoulder or horizontal against upper thigh. After touching (or more often missing) the target, subjects returned immediately to the starting position in one smooth movement. EEG was recorded from the scalp and from lateral face areas using 253 active electrodes while an Optotrak system recorded 3D finger, wrist, elbow, and shoulder as well as target positions. Independent component analysis of the unaveraged data identified 10-30 components of cortical origin. Event-related spectral dynamics applied to the activities of a number of these component processes demonstrated spatial specificity (e.g. during left or right reaches versus center), and gamma band bursts specific to labeled moments including movement onset or moments of maximum acceleration or velocity. This brain activity could be differentiated from similar activity in nearby scalp muscles.

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