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### **Where is time lost in the BMX SX gate start?**

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The gate start is a critical part of the BMX Supercross (SX) race, with competitors gaining a significant tactical advantage by having their handlebars in front at the base of the 8 m start ramp. Coaches dedicate a considerable amount of time training for this, but still are left in the dark as to which part of the start action is the most critical. This study sought to define phases of movement of this action using the invariant feature, relative time, as per Schmidt's Schema Theory. Ten maximum effort gate starts were performed by five Olympic BMX athletes on a SX ramp and were recorded with action cameras at 120 fps. The footage was analysed and the movement broken down into six phases. The relative time spent in each phase was correlated with the ramp kink time split, a common performance outcome measure of the

gate start. Between and within athlete invariance was assessed and confirmed. The second crank power stroke phase had the greatest correlation to performance outcome for the overall sample, however, it was clear that the determinant factor was highly individual. Thus, there is merit in assessing each athlete separately for their own distinct movement characteristics.