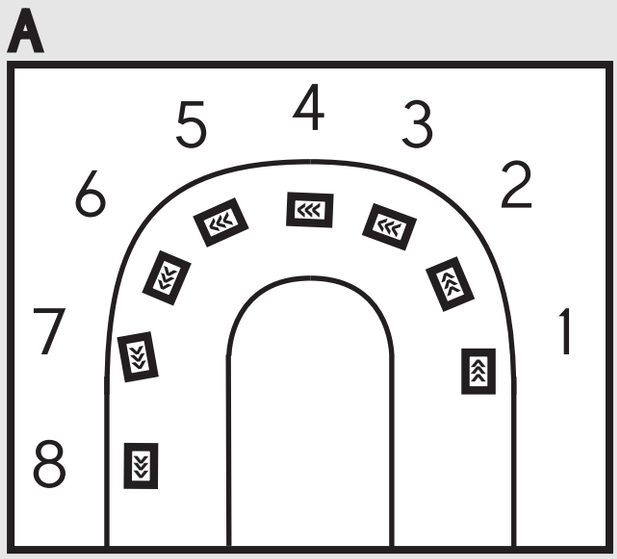

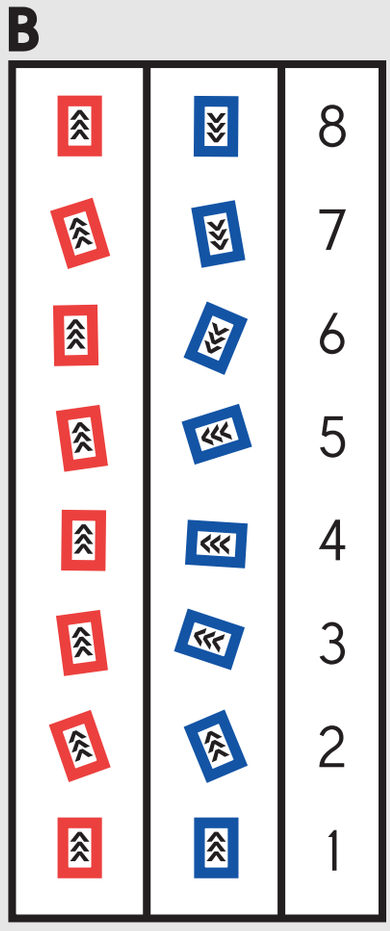

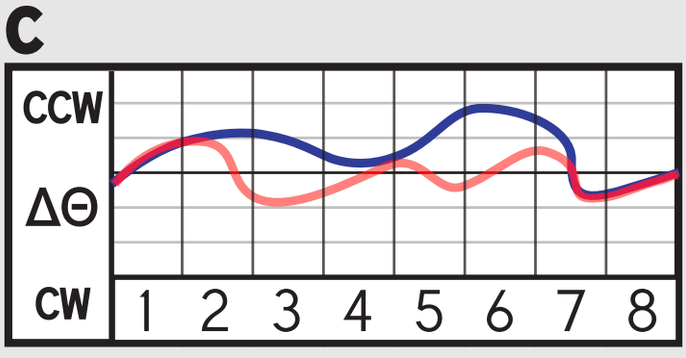

A shows a car travelling counterclockwise through a hairpin.

From 1 to 2 and 2 to 3, the car turns in sharply. From 3 to 5, the driver - having messed up - flattens out the middle of the corner and misses the apex completely. (He blames the setup.)

From 5 to 6 he's forced to turn in sharply, and on the exit between 6 and 7, the tail comes around. He corrects, and by 8 he's got the car back.

B shows the rough orientation of two simulators.

The blue simulator has unlimited rotation. Its orientation matches that of the vehicle at any give moment.

The red simulator has limited yaw, in this case about 30 degrees. In this illustration, the simulator is assumed to attempt a 1:1 match of vehicle orientation, and wash out over a relatively short period.

In reality, there would be a choice between this and cutting the rotation ratio in order to lengthen the washout time and make it less apparent - which would trade less obvious washout for less obvious vehicle feel.

C shows the change in orientation of the simulators through the progression of the corner. Points above zero indicate that the simulator is rotating counter clockwise; points below indicate the opposite.

Continuous rotation at a given rate is difficult to perceive; mainly we feel the change in rotation rate, which is what this graph shows.

The blue line, showing the continuous rotation simulator, is almost all above the horizontal line, since the car spends almost all of its time rotating counter-clockwise. Between 1 and 3, the car is rotating fairly rapidly as the driver enters the corner; between 3 and 5 the rate of rotation slows as he chops the corner off. From 5 to 6 the rotation rate is rises as he turns in at the exit, and then reverses to clockwise as the car comes around and is corrected between 7 and 9.

The limited rotation simulator must wash out the rotation in order to avoid 'winding up'. Over a 180 degree rotation, it needs to spend as much time rotating clockwise as it does counterclockwise. During a turn such as this, a limited rotation simulator with a fast washout must by definition be turning the wrong way half the time. It is accurate during the first and last parts of the turn, but 'wobbles' during the middle, and doesn't have the range to convey the sharp correction.