From slow motion to time lapse –Exploring biases elicited by altered video speed

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While decades of research have significantly advanced our understanding of time perception, the perception of (manipulated) video speed remains a relatively new and underexplored topic. With technological progress, the use of slow motion and time lapse has become ubiquitous in everyday life, offering new opportunities for detailed video analysis. Yet, recent research highlights potential biases in perception and low sensitivity to altered video speed. To examine the extent to which humans can perceive altered video speeds and how these manipulations influence duration perception, we conducted a series of experiments in which participants viewed short video clips at varying speeds. The results demonstrate systematic biases: overestimation of video speed during slow motion and underestimation of video speed when watching time lapse versions, intensifying with greater deviations from the original speed. Additionally, duration estimations varied systematically depending on video speed, insofar that slow motion videos were perceived as shorter in duration than videos at normal or faster speeds, suggesting a recalibration mechanism occurring during or after viewing. Both effects (misperceived video speed and video duration) seem to result in an erroneous “mental backwards calculation” in the attempt to infer the true duration of an event. This results in a distorted sense of elapsed time, which, in turn, typically can influence, for example, how intentional an action is perceived to be. The observed biases have broad implications for both time perception research and for applied contexts, such as legal or sports settings, where judgments are often based on modern video analysis and hence require careful consideration.

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