

## Department of Psychology

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### Arresting Perception: Animate Objects Capture Attention and 'Slow' Down Time

The increasing consideration of evolutionarily-relevant stimuli has reinvigorated the study of visual attention. Stimuli such as spiders, angry faces, and even animate objects categorically (humans and nonhuman animals) appear robustly, even uniquely, capable of capturing visual attention. Prioritizing the detection of such objects in the environment – though undoubtedly of great adaptive value – may be only the first advantage afforded by attention. We examined how attention may also augment their representation in our visual awareness. Increased attention to – and information processing of – a stimulus might result in its experienced duration exceeding its physical duration, an experience termed subjective time dilation. This prolonged visual representation might be most advantageous (and demonstrable) for very brief percepts, e.g. glimpsing an animal darting through foliage.

We predicted that the duration of briefly-displayed people and animals (both previously shown to be prioritized for visual attention) will more often appear greater than their veridical duration than will inanimate objects. We tested this prediction with the ‘oddball’ paradigm – the duration of an attention-capturing stimulus in a sequence of images will often appear longer than the other stimuli, even when displayed for less time than the ‘standard’ duration used for the rest of the sequence. One item from one natural category (people, animals, flowers, or vehicles) was presented in a series of urban and rural landscapes and ranged in duration from half to slightly longer than the standard duration. Participants were asked simply to identify which item in each stream of images was displayed for a greater amount of time than the others.

In two experiments – comparing against a standard duration of 120 or 220 milliseconds – animate objects were identified as the ‘longer’ images in the sequences far more frequently than chance – and significantly more frequently than the inanimate targets – even when presented for 50% of the standard duration. But this effect was not greater with the longer standard duration and proportionally longer target durations, suggesting that the ability of attention to prolong visual representations does not compound with increasing durations. To evaluate the effects of emotional valence, arousal, and threat on time dilation, an independently rated set of ‘threatening’ and ‘unthreatening’ animals were included in a replication. Interestingly, ‘threat’ did not provoke any greater degree of time dilation than was evident for all animate objects categorically. Additional experiments ruled out that the subjectively prolonged duration of animate objects resulted from differences in lower-level visual characteristics or dissimilarities from the distractor images. Brief glimpses of biologically relevant objects may thus be more persistently represented in visual awareness than other types of objects. These studies additionally demonstrate how duration estimation and subjective time dilation can be employed as a novel and implicit metric of attentional capture.