How many times and for how long do I see red? Judgements of frequency and duration in traffic simulations

In former studies on the mutual interdependence of judgements of frequency and duration, an asymmetrical relationship between stimulus frequency and stimulus duration has been obtained (e.g. Hintzman, 1970; Betsch, 2006): While frequency judgements were quite accurate and independent of stimulus duration, time estimations, in contrast, turned out to be highly dependent upon stimulus frequency. That is, the durations of more frequent stimuli are perceived as being longer, while long-lasting stimuli are not regarded as being more frequent. Within two studies (N=120), we examined the relationship between judgements of stimulus frequency and duration in realistic situations. Participants were presented short videos on a computer screen. The videos presented the view out of a car driving along a road. Therefore, the observers could easily imagine driving the car by themselves. Participants in this position were exposed to various waiting situations (e.g., traffic lights, pedestrian crossings, and police controls) with specific frequencies and durations. Each stimulus (a specific waiting situation) was presented either 2, 4, or 6 times, and each single presentation lasted for either 5, 10, or 20 seconds. Subsequently, participants were asked to estimate presentation frequencies and durations for each waiting situation. Results indicate that people are able to make relatively accurate judgements of frequency and duration of the presented stimuli. More frequent stimuli were reliably judged as having been more frequent, and stimuli with higher presentation duration were judged as being characterized by longer durations. In addition, subjective estimations of stimulus duration increase with higher presentation frequencies of the stimuli, even when stimulus duration was held constant. Moreover, and contrary to former findings, frequency judgements are also influenced by stimulus duration: Significantly higher frequency judgments are obtained for situations involving longer presentation durations when presentation is held constant. These results replicate very recent studies on time and frequency varying the degree of emotional or physical involvement of subjects (e.g. Glauer, 2006). Thus, whenever stimuli have a stronger practical relevance, judgements of frequency and duration affected mutually. For studies with more abstract stimuli, however (like the once of Hintzman and Betsch, with wordlists of first names or objects), it was more difficult for the participants to judge presentation durations. As a consequence, an asymmetrical interdependence of judgements of frequency and duration emerged in these studies, because judgements on stimulus durations can not have an effect on judgements of frequency if participants are not able to estimate presentation durations. Results are discussed with respect to practical implications for the design of waiting and traffic situations.

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