**Title:** “When viewing is already gambling”: the need for eye-tracking research to examine sports betting cue reactivity

**Author:** Damien Brevers1

**Author affiliation:** 1 Addictive and Compulsive Behaviour Lab, Institute for Health and Behaviour, Campus Belval, University of Luxembourg, Esch-sur-Alzette, Luxembourg

**Statement of competing interest:** Damien Brevers is supported by the Luxembourg National Research Fund (FNR); CORE – Junior Track [BETHAB]. Damien Brevers declares no conflicts of interest relevant to this manuscript.

**Key words:** Addiction, Gambling disorder, sports betting, eye-tracking, cue reactivity, sports

**Concise statement:** In many countries, it is currently possible to gamble on every sport events while being exposed to a high number of sports betting advertisements. Research is needed to examine how the increased popularity of sports betting is currently reframing the way that sports are being experienced by (young) sports fans.

**Commentary**

Murch et al. [1] demonstrated that specific patterns of eye movements (i.e., percentage of eye fixation on the game’s credit window) offer a relevant marker of gambling-related immersion experience among a sample of slot machine gamblers. The present commentary proposes that research on gambling disorders capitalize on the findings from Murch et al. [1] to progress towards a fine-grained understanding of an increasingly popular gambling habit, namely sports betting. Through easy access from a computer, tablet or phone, it is now possible to gamble on any sports event at any moment, such as before or during a game in play, and while being exposed to a high number of sports betting advertisements [2,3]. With this around-the-clock availability and persistent cues, merely viewing sports betting advertisements and their associated sports events should trigger advanced motivational and gambling-related decision-making processes. Accordingly, there is growing concern that the current normalization of sports gambling could have a significant impact on public health, including among children [4,5]. Research is thus needed to examine how the increased popularity of sports betting is currently reframing the way that sports are being experienced by (young) sports fans.

Initial strides towards this objective have been taken by neuroimaging research on cue reactivity [6]. Specifically, a recent functional magnetic resonance imaging study has shown that the brain processes information about sporting cues differently, depending on whether sports fans think about a sporting event with the intention of gambling on the outcome or think about it with the intention of merely watching it [7]. From the standpoint of the present commentary, the examination of sports betting cue reactivity should greatly benefit from a multilevel approach, featuring eye-tracking measurements. Indeed, a key feature of a cue reactivity paradigm is that it exposes participants to cues that depict real-life (gambling) situations through visual and/or auditory stimulations [6]. Hence, eye-tracking procedures should offer innovative markers of cue reactivity patterns that characterize the sports betting digitalized experience (i.e., number of eye fixations, prolonged maintenance of gaze, proportion of initial eye movements directed towards sports betting cues). Moreover, in reference to Murch et al. [1], the investigation of eye movements pertaining to gambling immersion seems particularly relevant to sports betting, as it binds gambling to sports watching (i.e., both activities related to high levels of passionate and immersive engagement [8-12]).

The singular nature of sports betting cues should also open new avenues for building experimental procedures that mimic ready-to-consume online rewards in today's environment. First, the perceptual patterns featured on the Internet or in smartphone apps (i.e., individuals exposed to rewards that are available at the touch of a screen or keyboard key) correspond well to cue reactivity laboratory procedures (i.e., individuals exposed to visual stimuli on a computer screen). Second, because every sports fan can express a degree of confidence in the result of a forthcoming sports event [6], research should be able to grasp how eye movements are modulated by the level of interest [7] and by the weighing process of deliberative thought [13] towards sports betting cues. Third, in contrast to sexual activity, or buying or consuming psychoactive substances, sports betting (and gambling per se) does not show sensory-specific satiety effects (i.e., declining satisfaction with repeated consumption of reward), as it involves cumulative monetary rewards. This latter aspect represents a considerable advantage for experimental tasks that alternate experimental conditions on a trial-per-trial basis (e.g., reward-blocking induction procedures [14,15]). Taken together, these patterns call for a new line of research to further establish the clinical validity of gambling cue reactivity with indices of duration or intensity of use, addiction severity, and current clinical status (active user, trying to quit, abstinent). It is also important to address these research questions while using a stepwise approach. For instance, Murch et al. [1] ran a convenience-sampled pilot study before undertaking their main study. This insightful procedure allowed these authors to develop data-driven preregistered hypotheses. The adoption of such an approach will thus increase the potential of experimental designs to identify the impact of individual-specific and study-specific factors on sports betting habits.

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