
The Performance Enhancement Attitude Scale (PEAS) reached ‘adulthood’: Lessons and recommendations from a systematic review and meta-analysis¹

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Highlights

- Performance Enhancement Attitude Scale (PEAS) has been the main assessment tool for doping attitude.
- This systematic review covers 18 years of doping attitude research using the PEAS.
- For the first time, meta-analysis was extended to internal consistency reliability.
- PEAS is reliable measure of moral doping attitude for adults.
- Evidence suggests that PEAS is not a suitable proxy for indexing doping behaviour.

UNDER REVIEW

Abstract

Doping is an omnipresent issue in both professional and amateur sports. Advances in social science research, including studies on doping attitude, have played a pivotal role in developing an understanding that prohibition and testing alone do not deter athletes from doping. Research on doping attitude has relied heavily on the Performance Enhancement Attitude Scale (PEAS). Yet, to date, no systematic review and meta-analysis of the PEAS have been conducted. Thus, the purpose of this study is, for the first time, to cumulate evidence for the psychometric properties of PEAS; specifically to conduct a qualitative synthesis and perform a meta-analysis to analyze the available results and findings for internal consistency reliability, gender differences and user/non-user differences in doping attitude assessed by the PEAS. PRISMA protocol was employed for data identification and selection. Included articles were assessed for data quality and biases. Meta-analysis with random effects models was used to determine overall internal consistency reliability (Cronbach's alpha) and descriptive statistics (Mean, SD) for a subset of studies using the full 17-item PEAS. Eighty-two studies were eligible for qualitative synthesis, and data from a subsample of 44 studies were meta-analyzed. The quantitative analyses yield an overall PEAS score of 39.18 (2.30 on a 6-point scale) and good internal consistency reliability (Cronbach's $\alpha = .81$ [95%CI .80, .83]). Males and admitted doping users scored higher on PEAS than females and non-users, but still within the 'negative' spectrum. Medium to strong correlations were recorded with moral disengagement ($r = .42-.75$). Overall, negative doping attitude characterized the athlete population, regardless of gender or involvement in doping. The latter, coupled with sole reliance on self-reports for doping, questions the validity of PEAS as proxy for indexing doping behavior. Future research will benefit from a standardized short version of PEAS. The consistent 'negative' range observed in PEAS scores, even among admitted dopers, suggests a potential moral conviction angle, which may limit the scale's utility as a global attitude measure and calls for further research whether re-calibration of the scale as a measure of moral doping attitude is warranted. Advances in doping behavior research calls for a more nuanced understanding of the role of attitudes toward doping and clean sport behavior; new and more specific attitude measures toward doping that separate moral and functional aspects effectively, along with a psychometrically sound instrument for adolescents.

Keywords

Doping; attitude; PEAS scale; performance-enhancement; sport; athlete

The use of prohibited doping substances to enhance physical and mental performance among athletes is an omnipresent and remaining issue in both professional and amateur sports (Aquilar-Navarro et al., 2020; Frenger et al., 2016; Ulrich et al., 2018). The formalized anti-doping system has made significant progress (Bowers & Bigard, 2017) and improved since the establishment of the World Anti-Doping Agency (WADA) in 1999 and the implementation of the first Anti-Doping Code in 2004. The Code has been revised four times since, with content changes reflecting the emerging new challenges. Globally installed formalizations of rules, responsibilities for athletes and stakeholders, and a network of doping control laboratories are strong indicators of a worldwide effort against doping use, along with the comparatively low figures of recent World Anti-Doping Agency's (WADA) annual report on tested athletes (1.42% Adverse Analytical Findings) (World Anti-Doping Agency, 2019). Notwithstanding, research and recently promulgated scandals among international sport federations suggest a higher use of doping substances among athletes (de Hon et al., 2015).

Traditionally, anti-doping policies have mainly focused on a 'detection and deterrence approach' (Elbe & Brand, 2016; Petróczi et al., 2017), which is designed to discourage athletes from using prohibited substances through bans from competition either for a certain period or for lifetime in case of proven use of substances. The history of doping control clearly shows that prohibition and testing alone do not deter athletes from doping. WADA and its signatories (national anti-doping associations, sport agencies and international sport federations) also target athletes with preventive strategies and anti-doping education. The focus here is on value-based character development, preferably beginning as early as possible in youth and adolescent ages. Athletes are supposed to develop and mature sound norms, self-efficacy, positive attitudes toward clean sport, which - coupled with favorable personality traits - should result in internal motivation to be clean and avoid use of doping.

Despite the tenuous direct link between attitude and behavior, doping behavior literature is teeming with attitudinal research based on the belief that 'wrong' attitudes are responsible for 'wrong' choices (using doping) by athletes. Blank et al. (2016) reviewed and affirmed the suggestion that attitude decisively influences and predicts doping susceptibility and behavior among competitive athletes. This is somewhat in contrast with a broader review and meta-analysis, which showed a moderate influence of doping attitude on doping use (Ntoumanis et al., 2014). It has been recognized that the decision behind doping is a complex psychological process involving environmental and social cognitive factors (Lazuras, 2015;

Hauw, 2017; Petróczi & Aidman, 2008; Petróczi et al., 2017; Woolf & Mazanov, 2017). Introduced to doping research by Petróczi et al. (2017), the Behavioural Reasoning Theory (Westaby, 2005) explains not only the planned actions but the motives underpinning human behaviors. The model addresses the theoretical and empirical importance of declared reasons, explanations and justifications for a given behavior; and posits that global motives (attitudes, subjective norms and perceived control) moderate the direct influence of values, beliefs and reasons on, but have no direct connection to, behavioral choices. In this model, which is in line with Ajzen's and Fishbein's theories of Planned Behavior and Reasoned Action (Ajzen, 1991; Fishbein & Ajzen, 1975), intentions predict behavior; global motives (e.g., attitudes, subjective norms, and perceived control) and reasons predict intentions. Importantly, beliefs and values predict reasons, and doing something and not doing it have their own separate set of reasons (Richetin et al., 2011). Applying this to doping, we can say that the reasons for doing something (e.g., using doping) are not the negated version of the reasons for not doing something (e.g., avoiding doping or following clean sport behavior). The former may be rationalized by perceived pressure to perform and progress, wanting to level the playing field or gain competitive advantage, making a fast return after injury, being competitive, or curiosity; whereas the latter may be driven by values and early childhood experiences, seeing doping as cheating, concerns about health and well-being – not the lack of perceived need for doping. (For details on reasons for and against doping use, readers are advised to consult Kegelaers et al. (2018), Lazuras et al. (2017) and Overby et al. (2013)).

Studies investigating doping behavior more often than not include attitude towards, alongside knowledge and beliefs about, doping, although the actual construct measured as 'attitude' is not always attitude *per se* but a mix of views, beliefs, expressed values and even hypothetical willingness. Attitudes and beliefs of various stakeholder groups such as athletes (Mazzeo, 2019; Morente-Sánchez & Zabala, 2013), medical professionals (Backhouse & McKenna, 2011) and pharmacists (Hooper et al., 2019), coaches (Barnes et al., 2020; Backhouse & McKenna, 2012) and athlete support personnel (Mazanov et al., 2014) have been extensively researched and reviewed. The role of athlete support networks on influencing athletes' attitudes toward doping and building anti-doping culture in the athletes' environment also received attention. For example, Barkoukis et al. (2019) investigated athletes' and coaches' views on the role of athlete support personnel on forming anti-doping attitude. Parental influence on athletes' attitudes has also been investigated (e.g., Blank et al., 2015a, 2015b; Dodge et al., 2015; Erickson et al., 2017).

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