

Original Research

Women can transfer their ability to cope with stress from sport to academic contexts

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Abstract: This study retrospectively examined 182 high school student-athlete women aged 13-18 using Fletcher and colleagues' (2005, 2006) stress, emotion, and performance model to evaluate the impact of coping on engagement in both sports and academic settings. Additionally, the transfer of coping from sport to study was studied, with sports task-oriented coping acting as a moderator. Results indicated that in sports, stress was positively associated with emotional coping and negatively with engagement, and task-oriented coping positively with engagement. In the academic setting, stress was positively correlated with distancing coping, and task-oriented coping positively with engagement. Emotional coping and task-oriented coping both served as mediators, and sports task-oriented coping moderated academic stress and task-oriented coping. The findings support the processual model of stress and suggest that task-oriented coping should be encouraged and emotion-oriented coping should be avoided in both sports and academic settings. Furthermore, sport task-oriented coping was shown to transfer to the academic setting, as academic task-oriented coping decreased when sport task-oriented coping was below a certain threshold. Thus, it may be concluded that coping is a life skill that facilitates engagement in activities and may be transferred from sport to study in this sample of female student-athletes.

Keywords: Adolescence; education; female; ex-post-facto design; selective methodology



1. Introduction

In this section, a model of stress will be defined and coping skills will be presented as mediators of the relationship between stress and engagement. Coping skills will also be discussed as life skills that may be transferred from sport to the academic context. Finally, the objectives and hypotheses of the study will be outlined.

Stress has been demonstrated to have an influential role in the health, perceived quality of life, behavior, and performance of those who experience it. Chronic stress is often linked to depression, relationship troubles, and other negative effects (Hammen, 2005; McEwen & Seeman, 1999; Schwabe & Wolf, 2010; Wang, 2005). However, stress does not always have negative effects and can even act as a stimulus or motivator for proactive problem-solving (Crum et al., 2013; Norem & Cantor, 1986a, b). This justifies the importance of analyzing the variables that interact with it.

Stress is typically defined as the experience of anticipating or encountering adversity in one's goal-related efforts (Carver & Connor-Smith, 2010). Fletcher and Fletcher (2005; Fletcher et al., 2006) proposed a model of stress, emotions, and performance that postulates three stages. The first stage, person-environment, involves the perception of the environment and an analysis of the degree of threat it poses. The second stage, emotion-performance, is when emotions associated with the perception of having or not having enough resources to cope with the situation arise.

The third stage is referred to as coping and outcome, wherein the individual confronts the situation and takes action before it, thus yielding a certain output. The model posits that the application of appropriate coping strategies increases the likelihood of obtaining positive results, with the process being influenced by personal factors (e.g., self-confidence) and situational factors (e.g., social support).

Coping is a cognitive and behavioral effort to manage demands that are perceived to exceed the individual's resources (Lazarus and Folkman, 1984). It is considered to be an important developmental asset and is integral to health promotion and primary prevention programming (Masten, 2001; Weissberg et al., 1991). Nicholls and Polman (2007) identified three dimensions of coping in their systematic review of it in sport. The first dimension is task/problem-focused/oriented coping, which refers to cognitive and behavioral attempts to manage distress by reducing or eliminating the stress factor. The second dimension is emotional or emotion-focused/oriented coping, which involves the regulation of emotional arousal and distress (Lazarus, 2000, 2006). When this coping fails to create a positive emotional state, it is referred to as negative emotional coping, characterized by the expression or acting out of emotions such as frustration or anger (Sandín & Chorot, 2003). Lastly, the avoidance or distancing coping includes behavioral and psychological efforts to distance oneself from a stressor (Krohne, 1993).

The effectiveness of any given coping strategy is contingent upon the context in which it is utilized, although certain strategies have been found to be more effective than others (Lazarus, 2000, 2006). Task coping strategies are most commonly employed by athletes (Polman, 2012) and are associated with better performance and mental wellbeing compared to those focused on emotion or distancing (Nicholls & Polman, 2007, Nicholls et al., 2012; Ntoumanis & Biddle, 2000). Studies have indicated a positive correlation between distance-oriented coping and anxiety (Hatzigeorgiadis & Chroni, 2007; Ntoumanis & Biddle, 2000), and a negative relationship between task-oriented coping and anxiety (Hatzigeorgiadis & Chroni, 2007). However, other studies have found no relationship between different coping strategies and competitive anxiety in high-

level athletes (Ivaskevych et al., 2020). Additionally, positive associations between task-oriented coping and engagement have been observed among university students (Kim & Duda, 2003).

A limited number of studies have investigated the associations between emotions and coping, or between coping and aspects of sports practice such as engagement. Pons et al (2018) examined the mediating role of coping between competitive anxiety and sports engagement. Two components of cognitive anxiety, worry and concentration, were found to be related to engagement. Worry displayed a direct effect on engagement, as well as an indirect effect via task-oriented coping. Meanwhile, disruption in concentration was linked to greater use of distance-oriented coping and lesser use of task-oriented coping. These findings supported the hypothesis that task-oriented coping is associated with improved outcomes.

The Fletcher et al. (2007) stress, emotion, and performance model proposes a sequence in which stress leads to coping, and depending on the type of coping utilized, consequences such as anxiety or engagement may result. This sequence was studied in the present research, in which stress, the three types of coping (task, emotional, and distancing), and engagement were analyzed.

Multiple studies have highlighted the challenges faced by high-level athletes when attempting to juggle both academic and sport obligations. Cosh & Tully (2015) identified some of the primary stressors of student-athletes, including schedule clashes, fatigue, financial pressure, and inflexibility of coaches. Additionally, they noted a lack of utilization of task-oriented coping strategies, which may result in greater mental and behavioral health problems. To address this issue, they suggested the implementation of programs to educate athletes in this type of coping. To date, no studies have assessed the associations between engagement variables

(such as stress and coping) between the academic and sport contexts.

Other studies have yielded evidence that athletes transfer life skills acquired in sport to other aspects of their lives, such as the academic context (e.g., Allen & Rhind, 2019; Bean et al., 2020; Chinkov & Holt, 2016; Pierce et al., 2017, 2018). Pierce et al (2017, p. 194) defined transfer in sport as “the ongoing process by which an individual further develops or learns and internalizes a personal asset (i.e., psychosocial skill, knowledge, disposition, identity construction, or transformation) in sport and then experiences personal change through the application of the asset in one or more life domains beyond the context where it was originally learned”, and presented a model of sport-based life skills transfer which takes into account the individual's unique set of internal and external assets. Nevertheless, no studies have investigated coping skills as mediators between stress and engagement, or the potential cross-moderation of sport task-oriented coping on the relationship between academic stress and task-oriented coping, which would suggest the transfer of sport-based coping skills to the academic domain.

The primary objective of this investigation was to examine the relationships between academic and sport stress, coping and engagement. It was hypothesized that academic and sport stress, coping and engagement would be correlated, and that perceived stress, both in the academic and sports contexts, would be associated with an augmented utilization of coping strategies. Furthermore, it was hypothesized that task-oriented coping strategies would correlate with increased engagement, while those based on emotion would be linked to decreased engagement.

The second objective of the study was to analyze the mediating role of coping between perceived stress and engagement in both sport and academic contexts. The third

hypothesis proposed was that task-oriented coping would act as a positive mediator, and emotional coping as a negative one.

The third objective was to explore sport task-oriented coping as a moderator between academic stress and task-oriented coping. The fourth hypothesis suggested that sport task-oriented coping would moderate the relationship between the perception of academic stress and academic task-oriented coping, indicating that the extent to which athletes employed task-oriented coping strategies in sports would determine the use of task-oriented coping strategies in the academic environment.

2. Materials and Methods

Subjects - The sample for this study comprised 182 female participants between the ages of 13 and 18 ($M = 14.85$ years, $SD = 1.83$) and an average academic record of 7.19 out of 10 in the previous year. The criteria for inclusion in the study were: being female, attending secondary education or high school, and engaging in sports. Participants were involved in individual sports ($N = 44$), team sports ($N = 12$), and combat sports ($N = 52$), at a competitive level ($N = 108$) and non-competitive ($N = 74$).

Design - A selective research methodology was adopted, with a retrospective ex-post-facto design.

Methodology - This study was approved by the University's Human Research Ethics Committee, in accordance with the ethical principles outlined in the Declaration of Helsinki. Informed consent was obtained from all participants prior to their involvement in the study. Onsite administration of several scales was then conducted during school or training hours, with researchers and teachers/coaches present.

A battery of scales was administered to measure coping, resilience, stress and engagement in the sports and academic environment (Table 1). The responses were collected using a Likert scale ranging from 1

(never) to 5 (very often) for all variables, except for the variable academic engagement, which employed a Likert scale between 0 (never) and 6 (every day). The scales had been previously validated; however, a reliability analysis was conducted in our sample to determine the internal consistency of the different dimensions, which yielded satisfactory results.

The Stress Perception Scale (Remor & Carrobes, 2001) and the Stress Scale in the Sports Field (Pedrosa et al., 2012) were utilized to measure academic and sport stress, respectively, with 14 and 15 items, respectively. The Coping Stress Questionnaire (Sandín & Chorot, 2003) and the Coping Strategies in Sport Competition (Molinero et al., 2010) were employed to measure academic and sport coping, respectively, with 42 and 38 items, respectively. Lastly, the Utrecht Work Engagement Scale (Parra & Pérez, 2010) and the Sports Engagement Scale (Belando et al., 2012) were utilized to measure academic and sport engagement, respectively, with 9 and 11 items, respectively.

Statistical Analysis - Upon acquisition of the data, we conducted descriptive and correlational analyses, as well as a mediation-moderation analysis using the PROCESS syntax for SPSS.

3. Results

Descriptive analysis - The results of the descriptive analysis showed that academic stress was higher than sports stress ($M = 3.36$ compared to $M = 2.23$) and sports engagement was greater than academic engagement ($M = 3.56$ compared to $M = 3.29$). Additionally, emotional coping was the lowest scoring style across both academic and sports environments. Sports task-oriented coping was higher than academic ($M = 3.26$ compared to $M = 3.01$), and academic distancing coping was higher than sports ($M = 3.22$ compared to $M = 2.42$) (see Table 1).

Table 1. Descriptive, reliability and bivariate correlations between the studied variables.

	M	SD	α	2	3	4	5	6	7	8	9	10
1. Academic stress	3.36	.65	.90	.36**	.09	.08	.16*	.15*	.36**	.12	.06	.12
2. Sports stress	2.23	.61	.90		-.08	.05	.11	-.13	.41**	.13	-.13	-.15**
3. Academic task-coping	3.01	.43	.66			.37**	.16*	.40**	.03	.12	.32**	.22**
4. Academic emotion-coping	2.36	.50	.74				.14	.22**	.25**	.11	.13	-.06
5. Academic distancing-coping	3.22	.66	.81					.25**	.19*	.18*	<.01	.22**
6. Sports task-coping	3.26	.72	.60						.10	.30**	.26**	.51**
7. Sports emotion-coping	2.37	.74	.83							.43**	-.11	-.08
8. Sports distancing-coping	2.42	.66	.87								.01	.03
9. Academic engagement	3.29	1.32	.83									.12
10. Sports engagement	3.56	.90	.76									

Note: ** The correlation is significant at level .01 (bilateral) / * The correlation is significant at the level .05 (bilateral) / α : Cronbach's Alpha.

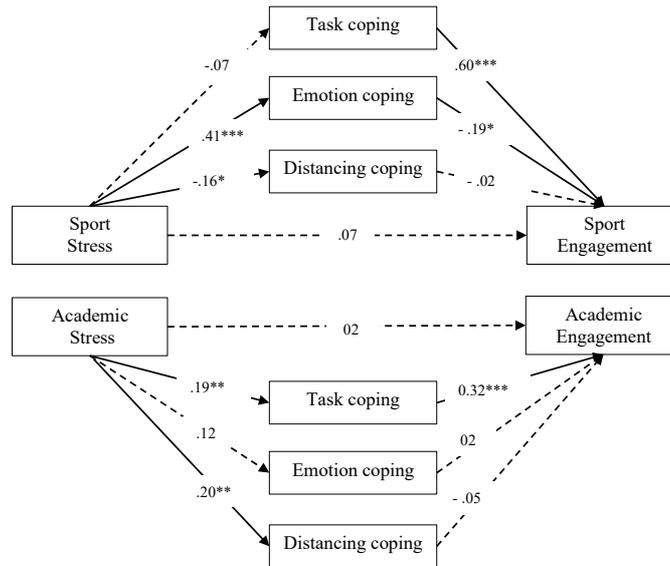


Figure 1. Coefficients β and significance in the sports and academic environments.

Table 2. Standardized indirect effects of academic stress on academic engagement, and of sport stress on sport engagement.

	Effect	BootSE	BootLLCI	BootULCI
TOTAL	.0533	.0335	-.0111	.1202
Academic task-coping → Academic engagement	.0614	.0327	.0026	.1311
Academic emotion-coping → Academic engagement	.0025	.0130	-.0267	.0282
Academic distancing-coping → Acad. engagement	-.0106	.0162	-.0447	.0212
TOTAL	-0.1247	0.0533	-0.2301	-0.0189
Sport task-coping → Sport engagement	-0.0429	0.0421	-0.1294	0.0375
S. emotion-coping → Sport engagement	-0.0783	0.0381	-0.1574	-0.0082
Sport distancing-coping → Sport engagement	-0.0035	0.0109	-0.0269	0.0193

BootSE: Bootstrapped Standard Error; BootLLCI: Bootstrapped lower level 95% confidence interval;

BootULCI: Bootstrapped upper level 95% confidence interval.

Correlations between sports and academic variables - A Pearson correlation coefficient of .36 between academic and sports stress ($p < .01$) was observed. Additionally, a moderate correlation between academic and sports coping categories was identified, with the highest correlation between task-oriented coping ($r = .40$; $p < .01$) and lower correlations between emotional ($r = .25$; $p < .01$) and distancing ($r = .18$; $p < .05$). Finally, academic and sports engagement were not correlated ($r = .12$; $p > .05$) (Table 1).

Correlations between stress, coping and engagement in the sports environment - A significant positive correlation was observed between stress and emotional coping ($r = .41$, $p < .01$), while a significant negative correlation was observed between stress and engagement ($r = -.15$, $p < .05$). Furthermore, a significant positive correlation was observed between task-oriented coping and engagement ($r = .51$, $p < .01$) (Table 1).

Correlations between stress, coping and engagement in the academic environment. A significant positive correlation was found between stress and distancing coping ($r = .16$; $p < .05$), and between task-oriented coping and engagement ($r = .32$; $p < .01$) (Table 1).

Mediation analysis of coping between stress and engagement in sport environment - We implemented a mediation analysis through PROCESS syntax (Hayes, 2017) with model 4 and the bootstrapping technique with 10,000 samples. The three types of coping (task, emotion, and distancing) were employed as mediating variables. The results are displayed in Figure 1 and Table 2.

An analysis of the standardized indirect effects of sports stress on sports engagement revealed that emotion coping was the only mediating variable as the confidence intervals did not exceed zero. Sports stress

was associated with greater levels of emotion coping, which in turn was correlated with decreased sports engagement.

A mediation analysis was conducted to explore the relationship between stress, coping, and engagement in an academic environment. The results of this analysis are presented in Figure 1 and Table 2.

The investigation into the standardized indirect effects of academic stress on academic engagement revealed that academic task-coping acted as the sole mediating variable, indicating a positive association between academic stress and increased task-coping, which was consequently associated with heightened academic engagement.

We hypothesized that sports task-oriented coping may act as a moderator of the relationship between academic stress and academic task-coping. Specifically, we predicted that student-athletes who used more sports task-oriented coping would utilize academic task-oriented coping strategies to a greater degree in response to academic stress. To test this prediction, we employed a mediation-moderation analysis, the results of which are presented in Figure 2 and Table 3.

The mediation-moderation analysis revealed that sports task-oriented coping had a moderating effect between academic stress and academic task-oriented coping (Index = $-.180$, Bootstrapped Standard Error = $.072$, Bootstrapped Confidence Interval: $-.319$, $-.039$). The Johnson-Neyman technique was employed to assess the indirect effects of quantitative variables, the results of which are displayed in Figure 3. It was observed that students with sports task-oriented coping scores below 3.04, tended to utilize academic task-oriented coping to a lesser degree in the presence of academic stress.

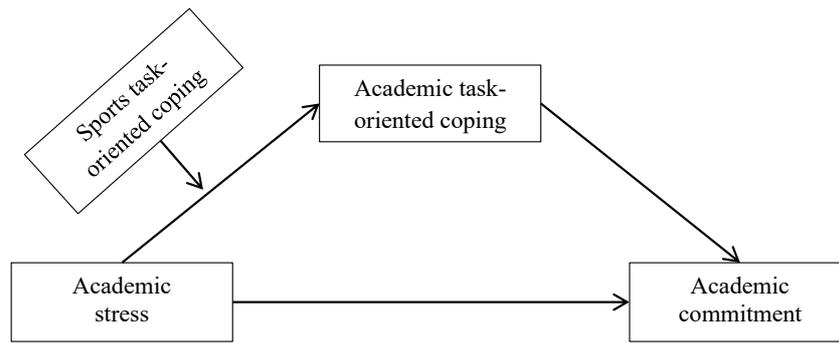


Figure 2. Mediation-moderation model.

Table 3. Coefficients *b* and significance of the relationships raised in the mediation-moderation model.

Relation	<i>b</i>	<i>t</i>	<i>p</i>
Academic Stress → Academic task coping	.64	3.80	<.001
Sports task coping → Academic task coping	.83	.42	<.001
Academic Stress * Sports task coping → Academic task coping	-.18	-3.47	<.001
Academic Stress → Academic engagement	.02	.16	.87
Academic task coping → Academic engagement	.98	4.45	<.001

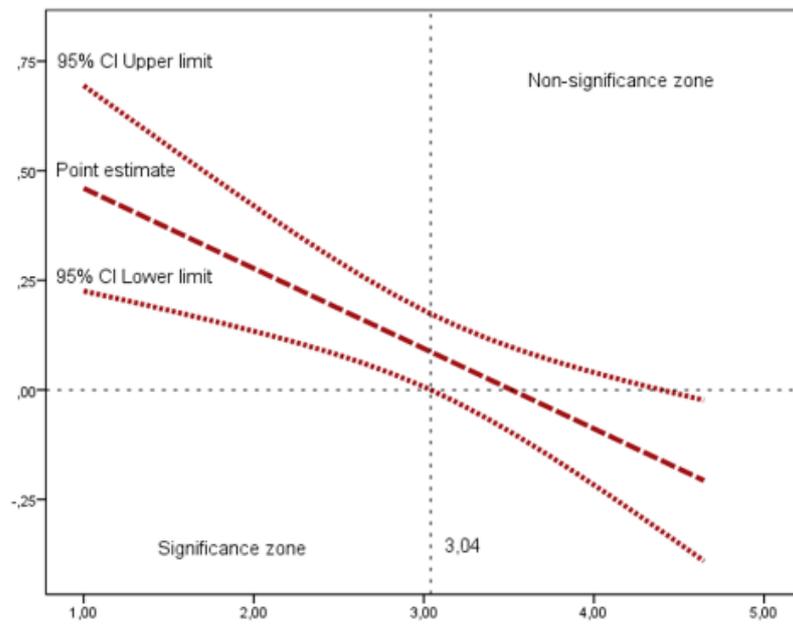


Figure 3. Conditional effect of academic stress on academic task coping (Y axis) based on sports task coping (X axis).

4. Discussion

To develop this section, we will first analyze the hypotheses raised, then we will reflect on the limitations of the study, and finally we will expose the implications of the results. We hypothesized that academic and sport stress, coping and engagement would be related. This hypothesis was supported for stress and the three types of coping, but not for engagement. It is possible that the perception of stress and the strategies used to cope with it may influence engagement, as well as perceived competence and confidence in the specific field (Duda & Balaguer, 2007). Our results suggest that learning coping strategies in one area may help individuals to utilize them to a greater extent in the other.

Second, it was hypothesized that stress in academic and sports contexts would be associated with the utilization of coping strategies, and furthermore, task-oriented coping would positively correlate with engagement, while emotion-focused coping would be associated with less engagement. The results of the analyses indicated that the relationships observed were in accordance with the hypotheses, but the associations between stress and all types of coping, as well as between all forms of coping and engagement, were as below.

In the present study, task-oriented coping was the most used in sports, in line with the results obtained in previous studies (Polman, 2012), and it was the only one that showed a high and significant correlation with engagement in the academic and sports environments, being consistent with studies that verified these relationships in university students (Kim & Duda, 2003)

On the other hand, emotion-focused and distancing coping positively related to the perception of sports and academic stress, respectively. These results support those of studies that previously linked emotion-focused and distancing coping with lower

mental well-being (Nicholls & Polman, 2007, Nicholls et al., 2012; Ntoumanis & Biddle, 2000). Sports emotion-focused coping also acted as a mediating variable between stress and enjoyment, enhancing the decrease in enjoyment. The previous study by Pons et al. (2018) had identified task-oriented coping as a mediating variable in a sample of adolescent athletes who played team sports, made up of 63.2% males. The result of our study with a sample made up exclusively of women showed that emotion-focused coping can also act as a negative mediating variable between perception of stress and enjoyment. These findings support the idea that the relationship between stress, coping and engagement is more multifaceted than a linear correlation, thus necessitating further research into the potential mediation of coping between stress and engagement.

Our third hypothesis proposed that coping would act as a mediator between perceived stress and engagement, with task-oriented coping being a positive mediator, and emotional coping a negative one, in both academic and sports contexts. Results indicated that coping acted as a mediator in both settings, but only emotional coping was determined to be a negative mediator in the sports context, such that a higher positive correlation between stress and emotional coping was associated with lower levels of engagement. Conversely, in the academic context, task-oriented coping was established to be a positive mediator, with a higher positive correlation between stress and coping being linked to higher levels of engagement. These findings were in accordance with expected results obtained by Pons et al (2018) who verified a mediating role of coping between competitive anxiety and sports engagement. Nevertheless results of our study demonstrated the mediating role of only one type of coping in each context. Consequently, further investigation of these results is warranted.

Engagement in sport and academic contexts may be mediated by different types of emotional and task-oriented coping strategies. In the context of sport, emotional coping can be especially important since athletes are often faced with fear, frustration, and anger. On the other hand, in the academic context, tasks and activities may not be as emotionally impactful, yet they still present a challenge that must be addressed properly. If the coping strategies are negative, they can present a significant threat to the young person's health and well-being. Thus, task-oriented coping is likely to be the main mediator between stress and engagement in academic contexts.

Finally, the fourth hypothesis was that sports task-oriented coping would act as a moderator between the perception of stress and the use of task-oriented coping in the academic environment. This hypothesis assumed that a skill learned in a given setting may be transferred to another one (Allen & Rhind, 2019; Bean et al., 2020; Chinkov & Holt, 2016; Pierce et al., 2017, 2018), although no previous study had analyzed the transfer in the form of moderation of task-oriented coping in the sports to the academic environment. The findings affirmed the hypothesis, demonstrating that the individuals with a level of sports task-oriented coping lower than 3.04 demonstrated a reduced utilization of academic task-oriented coping in the face of academic stress. This outcome supports the efficacy of sport as a platform to develop and execute strategies of task-oriented coping which can be applied to the academic setting. The current finding provides evidence for the long-held empirical observation by educators and coaches that athletes can learn to manage stressful situations in sport with task-oriented coping, which can be generalized to other contexts, including academic ones. Conversely, this result contradicts the notion that sports have minimal academic benefits for young people, and further suggests that a

lack of mastery of sport-related task-coping is associated with a diminished capacity for academic task-coping, which in turn is related to reduced academic engagement as hypothesized.

Limitations - This study was limited by the application of a selective ex-post-facto methodology, thus precluding the establishment of causal relationships between the variables under consideration. To validate a causal relationship, additional experiments must be conducted. Additionally, the sample of subjects was comprised of adolescent females from a particular nation and socio-cultural group. Furthermore, the proportion of team sport participants was lower than that of individual and competitive sports, potentially distorting the results due to the dissimilar motivational and behavioural aspects. Consequently, the findings obtained in this study should be further explored using additional samples from varying sexes, nations, ethnicities, etc.

5. Practical Applications.

This research underscores the significance of youth involvement in athletics and having coaches who instruct them in task-oriented coping. Researchers-trainers should recognize the various task-oriented behavioral approaches and create particular drills to instruct in the utilization of these approaches, utilizing all available resources, such as instructions, feedback, modeling, and trial-and-error.

6. Conclusions

The study's findings suggest that the type of coping employed for sports and academic stress is indicative of engagement to the activity and that task-coping in sport may aid the implementation of task-coping strategies in academics.

Supplementary Materials: The following are available online at

<http://eurjhm.com/index.php/eurjhm>, Figure S1: title, Table S1: title, Video S1: title.

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Conflicts of Interest: The authors declare no conflict of interest.

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