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On court wingwave® coaching improves accuracy and confidence in basketball athletes

Introduction

Cognitive strategies, including reframing, Socratic dialogue, and imagery, alongside arousal control techniques such as progressive muscular relaxation, have undergone thorough investigation and hold considerable importance for coaches and sport psychologists engaged in athlete-focused work (e.g., McCarthy, Gupta, & Burns, 2023). These strategies represent a fundamental component of the majority of interventions employed by professionals in the field (Jones, 2003), and those approaches have been subject to extensive research (e.g., Brown & Fletcher, 2017; Lochbaum et al., 2022; Reyes-Bossio et al., 2022). Sport psychology interventions primarily take the form of preperformance routines, encompassing a systematic arrangement of mental and physical preparations undertaken by athletes prior to engaging in a performance or competition (Jones, 2003). A key objective of these interventions is to mitigate the occurrence of choking under pressure, thereby, ensuring optimal performance in competitive settings. In extreme cases, choking under pressure can, if not addressed appropriately, lead to athletic trauma, which may stem from past or repeated adversities in performances in general or from specific performance situations (Curdt & Eggleston, 2023). In a systematic review, Gröpel and Mesagno (2019) found that preperformance routines or acclimatization training effectively improved athletes' performance under pressure. Mesagno and Mullane (2010) found preperformance routines helpful in situations where athletes suffer from state anxiety during high-pressure phases. Moreover, specific routines were observed to influence athletes' attitudes, leading them to perceive forthcoming competitive situations as challenges rather than threats, ultimately proving beneficial (Jones, Meijen, McCarthy, & Sheffield, 2009). Overall, the connection between stress and performance is well established; however, there is ongoing debate regarding the most effective approaches to help athletes cope with these challenges (Arnold & Fletcher, 2021; Ong & Chua, 2021). A growing body of research focuses on creating pressure in training to help athletes practice in an environment more similar to the competition setting than usual training (e.g., Low, Freeman, Butt, Stoker, & Maynard, 2022).

The infrequent systematic application of an intervention by a trained coach and with few time expenditure has been subject to research with regard to the wingwave® method initially (Rathschlag & Memmert, 2014) and performance specific in the school context (Weiland, Rathschlag, & Klatt, 2021) and with athletes (Weiland, Noël, & Klatt, 2023). The wingwave® method derives from eye movement, desensitization, and reprocessing (EMDR; Shapiro, 1989) and has been developed as a combination of EMDR set pieces and a muscular strength test (Besser-Siegmund, Siegmund, & Siegmund, 2020).

Shapiro (1989) developed EMDR as a therapeutic intervention. After stressful life experiences (Shapiro, 2018) as well as in various psychiatric contexts (e.g., posttraumatic stress disorder, childhood trauma, anxiety, depression) (Chen et al., 2018), this method has been found to be effective. In eight phases, EMDR is executed by a trained therapist who uses the protocol to assess the phases after another. The aim of the method is to first identify issues that the therapist should focus on. Once an issue, such as a traumatic childhood event experienced by the client, is identified by the therapist, the client is instructed to direct their awareness towards the visual image, thoughts, sounds, and concurrent emotions associated with this particular issue. While focusing on the bodily sensations and rational as well as emotional aspects linked to the issue, the client is asked to follow the therapist's moving finger from side to side with his or her eyes. Additionally, or instead, auditory stimuli can be used as well as tactile stimuli, i.e., claps on shoulders or knees (Benor, Rossiter-Thornton, & Toussaint, 2017). This procedure is executed until the intensity of the perception of the issue or trauma decreases and/or the perception of the sensations and feelings improves (Landin-Romero, Moreno-Alcazar, Pagani, & Amann, 2018).

The wingwave® method incorporates the EMDR protocol and adds an additional facet to it. As stress reduces the strength of finger musculature (Rathschlag & Memmert, 2013), the wingwave® method utilizes this to identify themes for the coaching process. The so-called Bi-Digital-O-Ring-Test (BDORT) was developed by Omura (1985) and has since been integrated as a key element of the wingwave® technique. During a wingwave® session,

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a trained coach asks the client to form a ring by joining the index finger and thumb, while the coach attempts to open this ring using both hands. Just before the coach attempts to pull the two fingers apart, they name certain aspects of the issue in question (e.g., elements of the situation, different emotional states such as "anxious" or "helpless", or beliefs such as "I cannot do it") or asks the client to express them. While or immediately after the word or the phrase is expressed by either the coach or the client, the coach assesses the client's strength by trying to open the ring formed by the index finger and thumb. If the ring opens, this is interpreted as a sign of emotional stress (cf. Rathschlag & Memmert, 2013), indicating that the topic is suitable for the EMDR component of the wingwave® method. In this study, the client is asked to identify both the bodily sensations (the individual response to the addressed situation, e.g., tension in the chest or a lump in the throat) and the accompanying emotion. As Weiland et al. (2021) point out, past events may cause an emotional reaction to the current issue and can, therefore, be addressed during the intervention. Regardless of the specific issue, the coach then employs various stimuli, as described above, in sets of 10 to 20 s until the body sensation changes and ultimately dissipates. This process continues until the client experiences a neutral or even positive emotional state while hearing or expressing the phrases that were previously perceived as stressful, which is confirmed by the strength of the ring formed by the index finger and thumb. Once the ring is tested as stable and securely closed, clients typically experience a sense of mastery over the issue, enabling them to handle similar situations more effectively in the future (Weiland et al., 2021).

EMDR has been investigated not only in clinical settings but also in coaching approaches, with evidence suggesting its utility in boosting performance confidence among musicians (Brooker, 2018), facilitating desensitization towards distressing events that impeded employee performance in the workplace (e.g., Foster & Lendl, 1996) and showing effectiveness in a case study involving two golfers (Curdt & Eggleston, 2023). Beyond that the wingwave® method has been investigated in various contexts and has been shown to be helpful in contexts of school anxiety (Weiland et al., 2021) and in anxiety reduction in general (Rathschlag & Memmert, 2014). Furthermore, Weiland et al. (2023) found that the use of the wingwave® method enhances the fluidity of gaze as well as the subjective rating of sport-related problems.

While there is a wealth of studies available in the field that focus on perception in sports (Hüttermann, Ford, Williams, Varga, & Smeeton, 2019; Klatt & Smeeton, 2020; Klostermann, Vater, Kredel, & Hossner, 2020) or the use and modification of questionnaires (Cid et al., 2022), there is a notable scarcity of scientific research focused on practical psychological or psychosocial coaching interventions specifically designed to enhance actual performance in competitive sports. This scarcity exists partly because isolated performances in a study context can only be academically linked to competition performance. To address this issue, the authors of the current study designed a setting in which the link between coaching and performance was directly embedded into the study design.

In this study, the wingwave® method was employed to focus on the performance factors of confidence and accuracy, both of which are critical to individual and team success in sports. Two hypotheses were tested in the experimental group compared to the control group:

1. Athletes in the experimental group will demonstrate enhanced performance, i.e., higher accuracy in throwing 30 free throws, following a wingwave® session compared to their pre-intervention performance.
2. Following a wingwave® session, athletes in the experimental group will exhibit a higher level of confidence, i.e., subjective perception, compared to their pre-intervention state.

Method

Participants

Prior to participation, all individuals provided written informed consent, and the study received approval from the ethics committee at the local university (009/2018). To determine the appropriate sample size, we conducted an a priori analysis for dependent means using G*Power software (Faul, Erdfelder, Buchner, & Lang, 2009). The results indicated that a total of 44 participants is sufficient to detect a small to medium effect size of $F = 0.22$ with a significance level (α) of 0.05 and statistical power of 0.80. Thus, 44 participants in the range of 16 to 32 ($M = 23.07$; $SD = 3.33$) years of age took part in this study including 22 males (11 experts, 11 novices) and 22 females (11 experts, 11 novices). Participants were defined as experts when they had played in the highest league in the season the assessment took place. Furthermore, experts attended a minimum of 7 h of basketball training per week ($M = 11.41$; $SD = 2.11$). Novices attended a maximum of 4 h of basketball training per week ($M = 1.34$; $SD = 0.99$). All participants were recruited via notices at schools, universities, and professional basketball clubs. Participants who regularly attended more than 4 h but less than 7 h of training per week were excluded from the study. After recruitment, appointments with the supporting coaches were arranged, and the study times were set for both groups. The first 22 participants per group (i.e., novices and experts) who were available at the specified times were selected and randomly assigned to either the experimental or the control group.

Procedure

All participants were randomly assigned to either the control or the experimental group. They were invited and asked to come to the facility where the study took place for a timeframe of 2 h. On the day their appointment took place, they were asked to fill out an informed consent form as well as a questionnaire on demographic data (age, gender, bas-

ketball training time per week). They were asked to throw 30 free throws (i.e., pretest) and were then assigned to either an experimental or a control group. After the study, the participants of the control group were given the opportunity to attend a wingwave® coaching as well.

On the respective day, the participants were given a ball in a gym with a basketball basket. They could then practice for 5 min, afterwards they came to the free-throw line and were asked to state their confidence via a subjective feeling scale (i.e., a Likert scale from 1–10; 1 being the lowest and 10 being the highest possible score). This scale was used in accordance with previous studies examining the wingwave® method and belongs to the usual manualized procedure of the method (cf. Weiland et al., 2021, 2023).

All free throws were judged by two independent spectators from zero points for a failure (i.e., ball does neither touch the rim nor the board; airball) until six points for a perfect success (i.e., only the net is touched by the ball). This mode made it possible to finer discriminate between the different qualities of the free throws compared to a binary score or no-score discrimination.

Participants in the control group were dismissed for 1 h with no task given to them, whereas participants of the experimental group were shortly introduced into the coaching procedure and then went directly into the coaching process with a wingwave® coach. This coaching process took a maximum of 50 min each. Overall, six coaches participated in this study (i.e., 22 coachings in total), each directed at least three interventions. Each coach had at least 3 years of experience coaching athletes with the wingwave® method, and the coaches were assigned to the participants based on the availability of the two involved parties. The coaches were instructed to follow a pre-established manual for the intervention, which had been developed prior to the commencement of the study. However, the basic procedure was nearly equivalent to the standard wingwave® protocol (cf. Weiland et al., 2021) and can be found in Appendix ◘ **Table A.1**. First, participants were asked to suggest a possible coaching topic. Coaches would hence manually test (cf. Rathschlag & Memmert, 2014; Weiland et al., 2021) the suggested topics until they would find a suitable coaching topic as a starting point for the coaching session. In case a suggested topic should not have been sufficient to serve as a starting point, a specially developed statement list (see Appendix ◘ **Table A.1**) was used by the coaches to address typical free-throw-related topics with the participants. However, in all of the cases, the participants' self-reported problems were considered suitable as a starting point for wingwave® interventions, so the statement list was not used.

Data analysis

This study is an experimental mixed design. Two 2 × 2 × 2 mixed ANOVAs (dependent variables: accuracy and subjective feeling) consisting of two between factors (group [CG, EG] and expertise [experts, novices]) and one within factor (time of measurement [t0, t1]) were conducted. The interpretation of effect sizes was based on current guidelines for effect size clarification in psychological science (Funder & Ozer, 2019).

Transparency and openness

Data were analyzed using SPSS (version 29.0.0.0, IBM, Armonk, NY, USA). This study's design and its analysis were not preregistered. All data can be made available by the authors upon request.

The study was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Results

All requirements for a repeated measurement ANOVA were met (Levene test all p's > 0.064, box test all p's > 0.111, correlations between dependent variables all p's < 0.504). Graphical control of normal distribution was performed using Q–Q plots. The Q–Q plots for the dependent variable accuracy and the Q–Q plots for the dependent variable subjective feeling can be found in Appendix ◘ **Fig. A.1 and A.2**, respectively.

Abstract

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On court wingwave® coaching improves accuracy and confidence in basketball athletes

Abstract

The short-term oriented coaching method known as wingwave® (Besser-Siegmund Institute, Hamburg, Germany) has demonstrated efficacy in boosting individuals' confidence related to future tasks, enhancing overall performance in sports motor tasks, and improving concentration abilities. Its procedure incorporates elements of eye movement and desensitization and reprocessing (EMDR) and adds a muscular strength test to reduce stress and anxiety for the athletes. In this study, amateurs and experts were observed performing a basketball-specific task. In two sets of 30 free throws, with a 1 h break between sets, 44 participants (aged 16–32), consisting of 22 experts and 22 novices in basketball, were randomly assigned to either the experimental or control group. The experimental group received one coaching session using the wingwave® method during the break. During coaching, specific emotional obstacles or blockades were identified and addressed using the wingwave® method by six qualified coaches. The findings reveal a statistically significant increase in accuracy, $F(1.40) = 4.74$, $p = 0.036$, $\eta^2 = 0.106$, Wilk's $\Lambda = 0.894$, in free throws as well as a notable boost in task-specific confidence (i.e., subjective perception; $F(1.40) = 4.21$, $p = 0.047$, $\eta^2 = 0.095$, Wilk's $\Lambda = 0.905$) in the experimental group compared to the control group. Based on these findings, it can be deduced that the wingwave® method holds promise as a valuable tool for mitigating stress and anxiety, while bolstering self-assurance and fostering confidence in one's own capabilities within a defined sporting context.

Keywords

Applied Sport Psychology · Basketball coaching · Anxiety reduction · Short-term coaching · Confidence enhancement

Table 1 Descriptive data of accuracy for all groups

Within factor	Between factor		Accuracy (0–180)		
Time of measurement	**Group**	**Expertise**	***n***	***M***	***SD***
t_0	CG	Novices	11	94.73	20.75
		Experts	11	139.36	17.57
		Total	22	117.05*	29.56
	EG	Novices	11	95.09	24.09
		Experts	11	141.27	15.02
		Total	22	118.18*	30.70
	Total	Novices	22	94.91	21.94
		Experts	22	140.32	15.98
		Total	44	117.61	29.79
t_1	CG	Novices	11	93.09	19.15
		Experts	11	143.00	19.16
		Total	22	118.05*	31.65
	EG	Novices	11	102.64	26.98
		Experts	11	150.64	14.83
		Total	22	126.64*	32.48
	Total	Novices	22	97.86	23.35
		Experts	22	146.82	17.12
		Total	44	122.34	31.99

CG Control group, *EG* Experimental group, *M* Mean, *SD* Standard deviation
*$p < 0.05$ between descriptive values

Table 2 Descriptive data of subjective feeling for all groups

Within factor	Between factor		Subjective feeling (1–10)		
Time of measurement	**Group**	**Expertise**	***n***	***M***	***SD***
t_0	CG	Novices	11	5.82	1.66
		Experts	11	7.18	1.08
		Total	22	6.50*	1.54
	EG	Novices	11	6.73	1.19
		Experts	11	6.91	1.38
		Total	22	6.82*	1.26
	Total	Novices	22	6.27	1.49
		Experts	22	7.05	1.21
		Total	44	6.66	1.40
t_1	CG	Novices	11	6.27	1.42
		Experts	11	7.91	0.94
		Total	22	7.09*	1.44
	EG	Novices	11	8.18	0.60
		Experts	11	8.00	0.89
		Total	22	8.09*	0.75
	Total	Novices	22	7.23	1.45
		Experts	22	7.95	0.90
		Total	44	7.59	1.24

CG Control group, *EG* Experimental group, *M* Mean, *SD* Standard deviation
*$p < 0.05$ between descriptive values

Hypothesis 1. Accuracy. The mixed ANOVA showed a significant main effect of time of measurement on the dependent variable accuracy, $F(1.40) = 7.62$, $p = 0.009$, $\eta^2 = 0.160$, Wilk's $\Lambda = 0.840$. Furthermore, there was a significant interaction-effect of time of measurement and group on accuracy, $F(1.40) = 4.74$, $p = 0.036$, $\eta^2 = 0.106$, Wilk's $\Lambda = 0.894$. There was no significant interaction-effect of time of measurement and expertise on accuracy, $F(1.40) = 1.07$, $p = 0.307$, $\eta^2 = 0.026$, *Wilk's* $\Lambda = 0.974$. Finally, there was no significant three-way interaction-effect of time of measurement, group, and expertise on accuracy, $F(1, 40) = 0.25$, $p = 0.617$, $\eta^2 = 0.006$, Wilk's $\Lambda = 0.994$. All descriptive data can be found in **Table 1** and a graphical representation of the significant interaction effect can be found in **Fig. 1**.

Hypothesis 2. Subjective feeling. The mixed ANOVA showed a significant main effect of time of measurement on the dependent variable subjective feeling, $F(1.40) = 31.48$, $p < 0.001$, $\eta^2 = 0.440$, Wilk's $\Lambda = 0.560$. Furthermore, there was a significant interaction-effect of time of measurement and group on subjective feeling, $F(1.40) = 4.21$, $p = 0.047$, $\eta^2 = 0.095$, Wilk's $\Lambda = 0.905$. There was no significant interaction effect of time of measurement and expertise on subjective feeling, $F(1.40) = 0.02$, $p = 0.892$, $\eta^2 < 0.001$, Wilk's $\Lambda > 0.999$. Finally, there was no significant three-way interaction effect of time, expertise, and group on subjective feeling, $F(1.40) = 0.92$, $p = 0.344$, $\eta^2 = 0.022$, Wilk's $\Lambda = 0.978$. All descriptive data can be found in **Table 2** and a graphical representation of the significant interaction effect can be found in **Fig. 2**.

Discussion

In this study, the application of the wingwave® method in both novice and expert basketball players was successful in enhancing accuracy and subjective confidence in executing a motor task, specifically 30 free throws. Compared to the control group, athletes in the experimental group showed significantly higher mean values of subjective con-

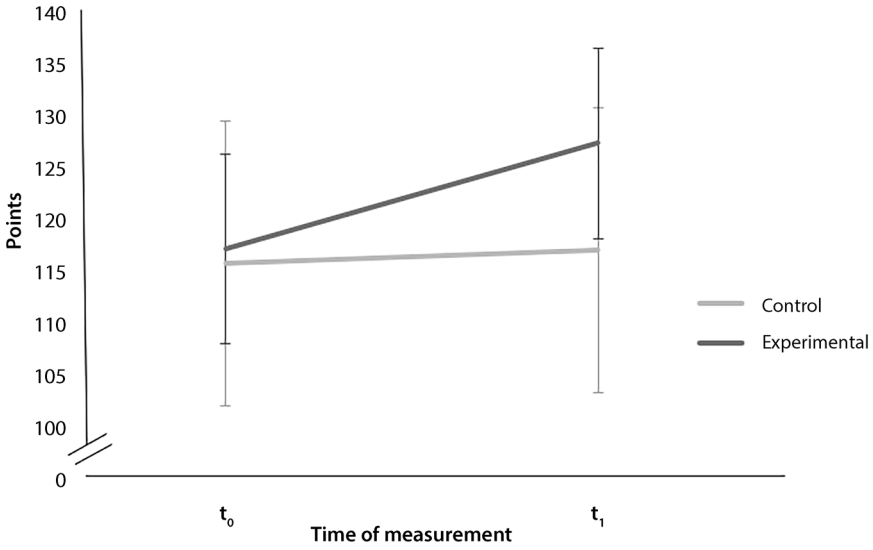

Fig. 1 ▲ $N = 44$; graphical representation of the significant interaction effect between time of measurement and treatment group (CG, EG) on the scored points ($p = 0.036$). The *error bars* show the standard deviation of the scored points of the participants in the different groups and time of measurement (t0, t1)

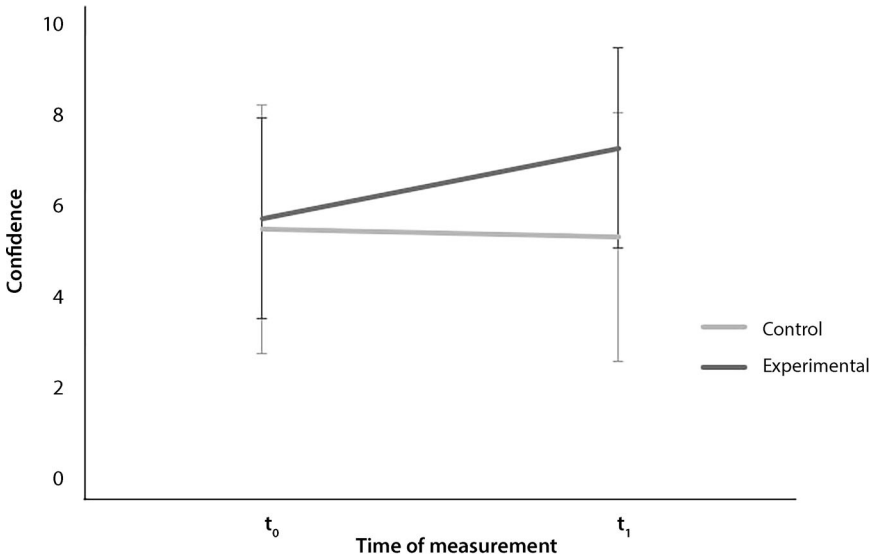

Fig. 2 ▲ $N = 44$; Graphical representation of the significant interaction effect between time of measurement and treatment group (CG, EG) on the subjective confidence ($p = 0.047$). The *error bars* show the standard deviation of participants' confidence level in the different groups and time of measurement (t0, t1)

fidence before attempting the 30 free throws for the second time, after having received coaching with the wingwave® method. Additionally, participants in the experimental group demonstrated significantly greater accuracy than those in the control group. Thus, both hypotheses were confirmed.

As Brooker (2018) found for musicians, performance confidence was enhanced in this context. Unlike studies focused solely on desensitizing past disturbing events (cf. Foster & Lendl, 1996), the goal of this study was to specifically enhance performance and confidence through the applied intervention. Nevertheless, when past events were addressed during the coaching sessions, the coaches aimed to foster desensitization. The effect of this desensitization can, therefore, be considered as a contributing factor to the overall effect observed in this study.

As stated above, one of the issues of performance-related studies that have investigated the effects of psychological or psychosocial coaching is that isolated performance in a laboratory setting is hardly useful for performance improvement. In this study, the authors aimed at performance improvement in a setting of laboratory conditions. However, the outcome, i.e., performance improvement, can easily be seen as directly useful for any form of training process. The link to a performance that might be weeks away and takes place in front of many thousands of viewers besides the field with other players and unknown opponents cannot be drawn here. Still, a simple improvement in one of the basic techniques (i.e., free throws in this study) and/or confidence regarding the next task is an indication that the wingwave® method may be a useful tool for athletes, at least for short-term improvement. This finding contradicts with the findings of Brown and Fletcher (2017), who did not find significant beneficial effects for the athletes immediately after applied interventions. The immediate improvements observed in this study could therefore—if replicated through similar studies in different sports—mean that the strength of wingwave® is not only its immediacy in effect, but also its time-economical superiority compared to other methods that need two (e.g., Brooker, 2018) or 1–10 sessions (e.g., Foster & Lendl, 1996) while a successful wingwave® intervention can already be applied in only one session of not more than one hour.

From a practical perspective, there is reason to be optimistic about the potential long term-effects of the wingwave® intervention on athletes' task-focused and even global confidence before competitions, as well as on their overall performance. Regarding long-term effects, the authors strongly recommend including competitive data in future assessments following one or more wingwave® coaching sessions with athletes in actual competition and repeated training situations. As mentioned earlier, medium- and long-term effects of the wingwave® method have already been observed in various contexts (e.g., Weiland et al., 2021).

Future studies should also focus on examining the wingwave® method exclusively with expert athletes to investigate

whether this coaching method can sustainably and long-term improve peak performance and both task-orientated and global confidence. Additionally, the examination of performance in a more naturalistic setting (i.e., during real competitions) following one or more wingwave® coaching sessions should be a key focus of future research. As previously mentioned, medium- and long-term effects of the wingwave® method have been observed in various contexts (e.g., Weiland et al., 2021). Future studies should focus on applying the wingwave® method with expert athletes to investigate whether it can sustainably enhance peak performance.

As a possible link to Jones et al. (2009), the participants in the experimental group were coached to optimize details in the process of their free-throw routine throughout the coaching on an emotional level. Because of this, this might have modified a threat to a challenge state. This approach might be one of the ingredients for the performance improvement in this study. Accordingly, practicing mental-health experts in the field could combine immediate (i.e., through the wingwave® method) and longer lasting effects (through other interventions) in a unique multimethod design, to achieve even greater enhancements and reach athletes on even more levels.

Furthermore, as mentioned in the introduction, the wingwave® method could be particularly used when time is limited, such as before competitions. Regarding strengths and limitations, the experimental setting—utilizing a naturalistic task like free throws during competitions—provided a valid and accurate measure of performance before and after the intervention, which is a notable strength of this study. Additionally, the short-term coaching method explored in this study can be applied during a season, close to competitions, or following setbacks, based on the results observed. This suggests that the ecological validity of this approach offers significant scientific and practical value for team sports and warrants further investigation.

However, this study has some limitations, including the relatively small sample size and the overlap between the dependent variables of accuracy and successful hits, which led to the exclusion of the latter variable. Future studies should consider incorporating a range of performance parameters and possibly include multiple tasks postintervention to measure performance more comprehensively. Despite these limitations, an increase in successful hits was observed in the experimental group from t0 to t1, in contrast to the control group. This effect was also noted among the expert athletes, suggesting that future research should specifically investigate the effects of the wingwave® method on expert athletes.

While the current state of knowledge does not yet permit definitive conclusions regarding potential shifts in motivation, emotional states, or cognitive processes occurring within the context of wingwave® sessions, an avenue of consideration arises wherein the coaching paradigm examined within this study could conceivably serve as a valuable substitute or complement to repetitive practice or conventional verbal interventions. As a possible future approach, a desensitization of disturbing events in a sport context in general or even in a specific situation (e.g., a free throw) could be of interest (cf. Foster & Lendl, 1996). Because Gröpel and Mesagno (2019) found that preperformance routines help athletes under pressure, an approach of a development of a routine could be focused on in future studies as well. This would not only identify the possible weak testing parts of the routine as to be modified, but also strengthen the confidence of the athlete through a positively experienced muscular test concerning the routine developed to the end. Similarly, based on systematic creation of pressure in the training process as a preparation for competition (cf. Low et al., 2022), the wingwave® method could be useful in the coping process (e.g., anticipation of stressful situations) prior to competitive settings.

Conclusion

The use of the wingwave® method with both basketball novices and experts in a free-throw situation resulted in increased confidence and improved accuracy. These findings are consistent with results observed in other contexts using the same method (Weiland et al., 2021; Weiland et al., 2023) and the EMDR component of the method (e.g., Brooker, 2018). Future research should investigate the effects of the wingwave® method on mid-term and long-term performance, as well as compare it to other evidence-based interventions. To conclude, the wingwave® method represents a valuable alternative or supplementary intervention for cases where professional psychosocial counseling is needed but time is limited, a situation frequently encountered in performance-orientated sports.

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Declarations

Conflict of interest. F.P. G. Weiland, R. Schrödter, K.E. Schul and S. Klatt declare that they have no competing interests.

For this article no studies with human participants or animals were performed by any of the authors. All studies mentioned were in accordance with the ethical standards indicated in each case.

Appendix

Table A.1 Statement list. Results of a survey among sport students ($n = 67$) with basketball affinity prior to the study. Obstacles that were frequently mentioned (> 3) were noted and, hence, divided into three areas as it can be seen as possible starting or additional focus points during the wingwave® coaching processes in this study

Person	Task	Environment
Fear of failure	Throw routine	Spectators
Tension	Optimal performance characteristics of the throw	Score expectation
Concentration/Attention(too many distracting thoughts)	Technical execution of the throw/throwing routine	Expectations of coaches and team
Knowing about the opportunity to score/Pressure	Foot position/Leg position/Upper body Position/Head position/Arm position/Hand Position/Dropping/Capping the hand	Special/Selected people in the audience
No outside influence/100% responsibility		Trash talk from opponents
Previous gameplay/Unsuccessful actions		Opposing fans (Sounds/Phrases/Sayings)
Fear (e.g., due to the possibility of missing a chance to score/Airball)		Current score (e.g., crucial, not decisive etc.)

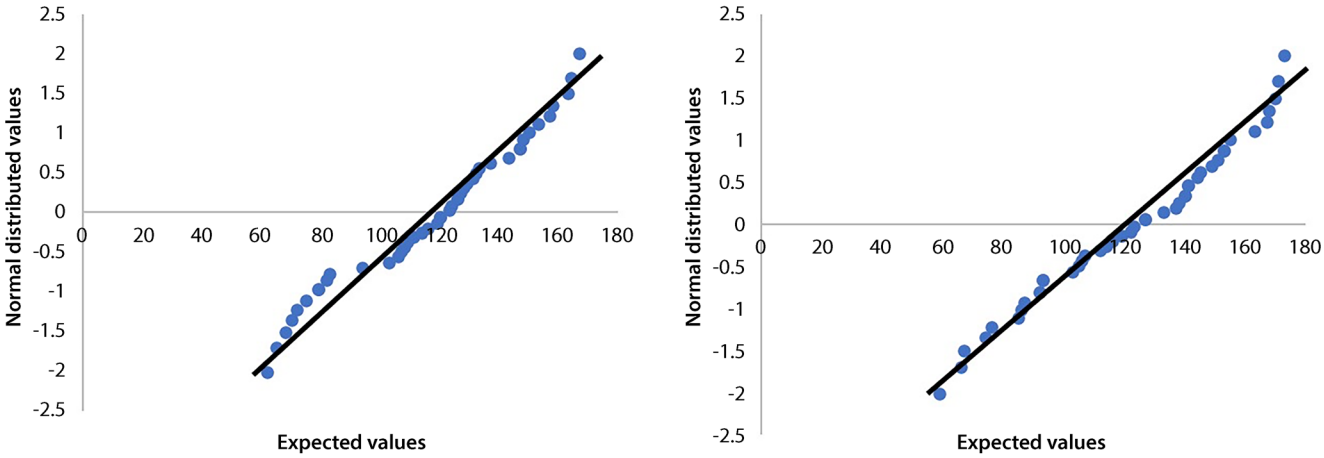

Fig. A.1 ▲ $N = 44$; Q–Q plot on the *left* shows the distribution of the accuracy measures on time of measurement 0 and the Q–Q plot on the *right* on time of measurement 1. Shapiro–Wilk tests showed no significant violation of normal distribution (both $ps > 0.079$). The plotted points on the Q–Q plot show the quantiles of the dataset against the quantiles of the normal distribution. If the points on the Q–Q plot are close to the straight diagonal line from the bottom left to the upper right, this indicates that the dataset is similar in distribution to the normal distribution (i.e., expected values)

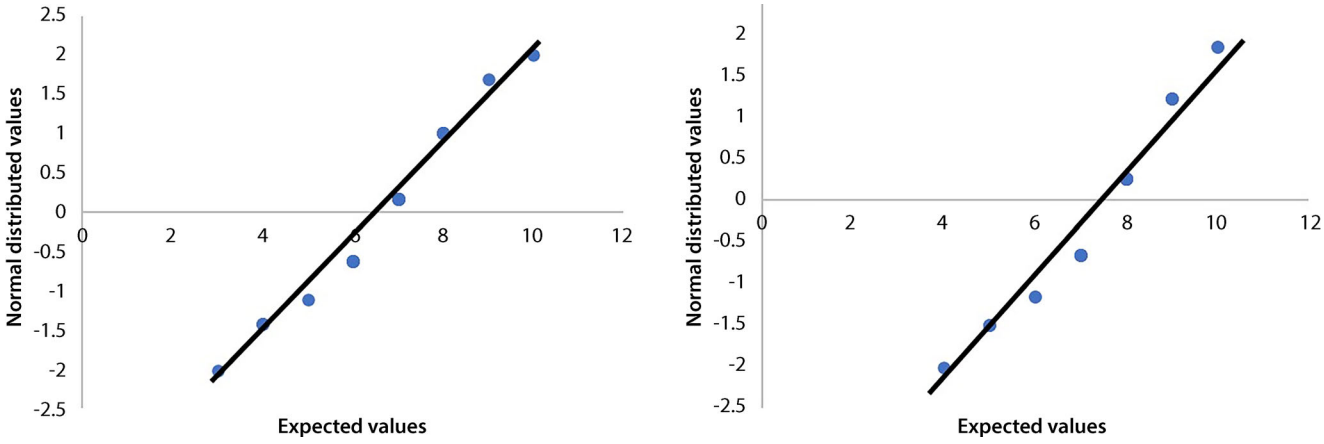

Fig. A.2 ▲ $N = 44$, Q–Q plot on the *left* shows the distribution of the subjective feeling measures on time of measurement 0 and the Q–Q plot on the *right* on time of measurement 1. Shapiro–Wilk tests showed a significant violation of normal distribution ($p = 0.003$); however, after the visual inspection of the Q–Q plot, we assess the deviations as approximately normally distributed. The plotted points on the Q–Q plot show the quantiles of the dataset against the quantiles of the normal distribution. If the points on the Q–Q plot are close to the straight diagonal line from the bottom left to the upper right, this indicates that the dataset is similar in distribution to the normal distribution (i.e., expected values)

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