



*Original Research*

## **A Theoretical Approach to Verbal Encouragement to Enhance Exercise Performance**

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### *Abstract*

*International Journal of Exercise Science 19(5): 5006, 2026.* Verbal encouragement (VE) has previously been linked to improved exercise performance and reduced fatigue; however, it is still unclear what VE phrases lead to optimal performance results. Achievement Goal Theory identifies that a motivational climate may emphasize either personal improvement (mastery) or performance relative to peers (performance). However, research applying this theory in an acute, exercise setting is limited. The aim of this study was to evaluate the effects of mastery VE (MVE) and performance VE (PVE) on exercise performance during 1RM bench press, PACER, push-up, and plank assessments. Sixty college students were recruited and randomly assigned to either MVE, PVE, or control (C) in which they completed two baseline and two experimental visits. HR was measured immediately post-exercise for each assessment. A 2 (visit) x 3 (group) ANOVA with a Bonferroni adjustment was used to test for group differences in performance from baseline to experimental condition. Significant plank differences existed between MVE, PVE, and C groups ( $F(2,57) = 20.394, p < 0.001, \eta^2 = 0.47$ ), with significant group differences between PVE and MVE ( $p = 0.002$ ), PVE and C ( $p < 0.001$ ), and MVE and C ( $p = 0.015$ ). From baseline, the PVE group improved plank time by  $50.5 \pm 35.6$  seconds, MVE improved by  $22.0 \pm 14.7$  seconds, and C decreased time by  $1.9 \pm 21.7$  seconds. No other significant differences existed among VE groups for the PACER, 1RM bench press, and push-up. Our study confirms the importance of VE to improve acute exercise performance and suggests that types of VE may impact exercise tasks differently.

Keywords: Motivation, achievement goal theory, acute performance

### **Introduction**

Regular exercise is vital in maintaining physical health and fitness and enhancing quality of life.<sup>1</sup> However, achieving consistent physical activity engagement is challenging, and only 24.2% of Americans are meeting Physical Activity Guidelines.<sup>2</sup> During exercise, coaches, and clinicians alike often motivate participants with verbal encouragement (VE) to maximize exercise performance or enjoyment.<sup>3</sup> Indeed, numerous research has supported the positive effects of VE on multiple exercise outcomes including improved exercise session termination time,<sup>4</sup> muscular strength,<sup>5,6</sup> and both anaerobic and aerobic exercise performance.<sup>7,8</sup> Evidence also suggests that VE may influence an individual's motivation to participate in exercise the following day, emphasizing the significant role that VE may play in exercise program adherence.<sup>7</sup> However, in most experimental studies, the content of VE is often general (e.g. keep going) or not reported.<sup>3,9</sup>

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Importantly, the phrasing of VE lacks a theoretical framework, potentially hindering its impact in effectively improving exercise performance and fostering intrinsic or extrinsic exercise motivation.

Achievement Goal Theory (AGT) may provide a framework for VE phrasing, particularly through the concept of motivational climates.<sup>10</sup> Within AGT, a motivational climate may be particularly important in fostering intrinsic motivation (mastery) or extrinsic motivation (performance).<sup>11-13</sup> A motivational climate is shaped by key elements including directions given, feedback (including VE), and achievement,<sup>11,12</sup> in which each element may have either an intrinsic or extrinsic emphasis.<sup>11-13</sup> Mastery motivational climates generally result in improved exercise performance and adherence through increased intrinsic motivation,<sup>11,14</sup> while performance motivational climates may lead to maladaptive responses including increased anxiety, reduced effort, and fear of failure responses.<sup>12,15</sup> AGT may play a crucial role in relation to VE by reinforcing a mastery-oriented climate, potentially improving exercise performance and enhancing exercise adherence.

Several studies have shown a positive link between VE and exercise performance and exercise adherence, but it is unclear how the content of VE may affect this relationship. VE literature lacks a theoretical framework, and the impacts of a mastery or performance motivational climate during an acute bout of exercise are unknown. Therefore, the present study first aimed to replicate past findings, by testing whether exercise performance differed among groups receiving VE compared to the control group (no VE). Second, the study aimed to test if the effects of two different VE climates, mastery and performance, differed on exercise performance.

## Methods

### *Study Design*

This study utilized a randomized, repeated measures, experimental design to examine the effects of mastery VE or performance VE on exercise performance during 4 tasks (Figure 1). All participants completed each task without any VE (baseline) and all tasks with either mastery VE, performance VE, or control (no VE). All research visits were scheduled at the same time of day for each participant to minimize potential time of day confounding factors. At their first visit, participants were randomly assigned to one of three groups: mastery VE (MVE), performance VE (PVE), or control (C). The primary outcome variables were improvements in total weight lifted during the 1RM bench press, number of shuttles completed during the PACER, total push-ups recorded, and total time held in the plank position.

### *Participants*

An *a priori* power analysis (G\*Power v. 3.1.9.7) indicated that 51 participants were required to reach a moderate effect size (Cohen's  $d = 0.5$ ), desired power of 0.8, and alpha level of 0.05 for a repeated measures design with 3 groups. Seventy-five participants ( $\geq 18$  years) who were current college students and fluent in English were recruited for the present study. Participants were excluded if they were responded 'yes' to any questions on the Physical Activity Readiness Questionnaire for Everyone (PARQ+).<sup>16</sup> The PARQ+ is a validated self-administered screening tool designed to identify medical conditions or risk factors that may require further medical evaluation prior to engaging in physical activity.<sup>16</sup> This study was approved by the Institutional Review Board (#18983-001) at Washington State University and all participants completed an informed consent prior to beginning the study. This research was carried out fully in accordance with the ethical standards of the International Journal of Exercise Science.<sup>17</sup> Participants were

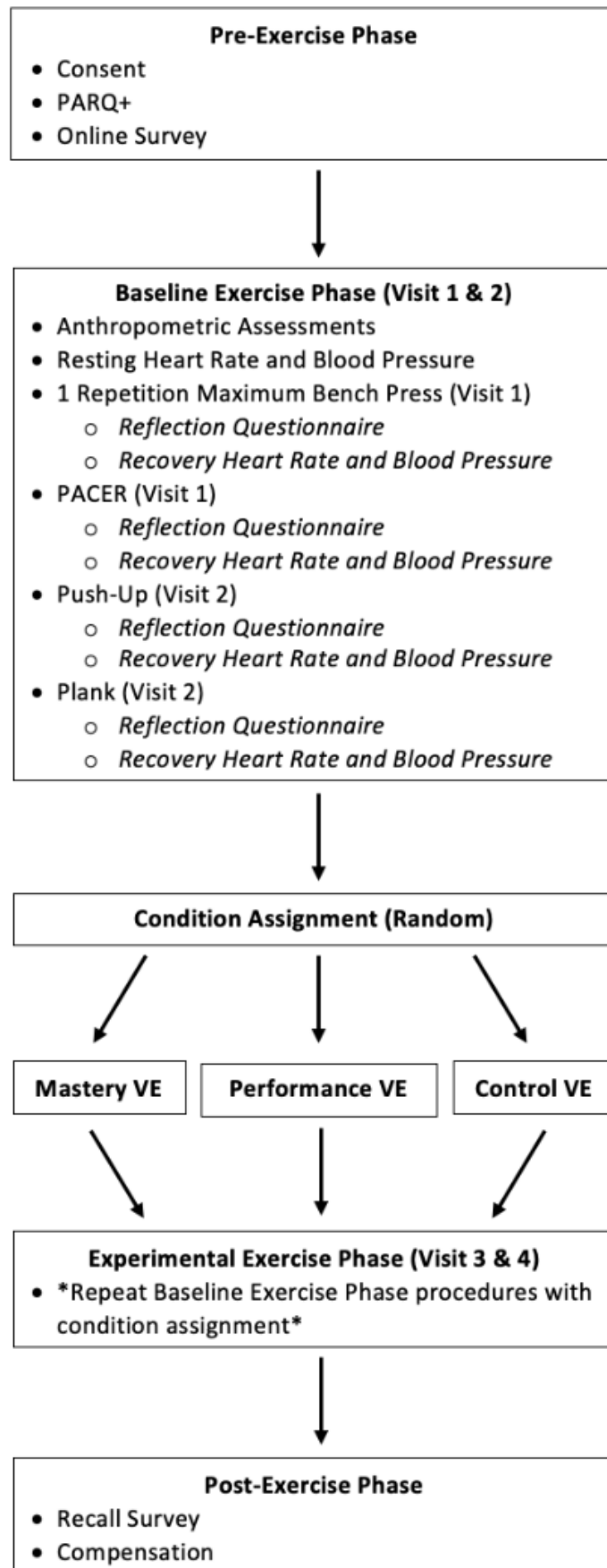


Figure 1. Experimental Testing Overview.

compensated with a \$15 Amazon Gift Card for their participation.

### *Questionnaires*

At visit 1, participants completed an online questionnaire to assess previous physical activity and exercise experience, basic demographic information, task experience and perceived confidence (1 repetition maximum (RM) bench press, PACER, push-up, and plank), and goal orientation in exercise (GOEM).<sup>18</sup> The GOEM, a validated measure, asks participants 10 questions on a 10-point rating scale. Question scores were then summed for mastery and performance orientation scores.<sup>18</sup> Participants were also asked if they were currently physically active (yes/no), and if active, were asked to describe the types of activities they currently participate in.

### *Exercise Testing*

At the beginning of each assessment, anthropometric measurements (height and weight), resting heart rate, and blood pressure were measured. Participants completed 4 exercise tasks, including 1RM bench press, PACER, push-up, and plank twice, once during baseline, and once during their assigned experimental condition (Figure 1). Research visits were separated by a 48-hour interval to minimize the potential effects of fatigue on exercise performance. At visit 1 and 3, participants completed the 1RM bench press and PACER, and the push-up and plank during visit 2 and 4. Each exercise performance task represented a different aspect of physical fitness, including dynamic muscular strength (1RM bench press), cardiorespiratory performance (PACER), isometric muscular endurance (plank), and dynamic muscular endurance (push-up). The selected tasks were chosen to examine if responses to VE differed by task type and to examine measures that require minimal specialized equipment available in both lab and field settings. In addition to evaluating performance on each exercise task, heart rate (HR) was measured immediately post-exercise as an indicator of physical effort exerted and utilized as an objective physiological manipulation check.

#### 1. 1RM Bench Press:

Participants completed a standardized warm-up before beginning their 1RM attempt. Participants completed 2 warm-up sets, the first at ~50% of their perceived maximal capacity for 5-10 reps, and the second at ~70% of their perceived maximal capacity for 3-5 reps.<sup>19</sup> Between warm-up sets and 1RM attempts, participants self-selected their rest period, between 1 minute (minimum) and 5 minutes (maximum). Each participant had a maximum of four attempts, and the 1RM was documented as the heaviest weight lifted successfully.<sup>19</sup>

#### 2. PACER:

All participants completed the PACER, a multistage aerobic capacity test that progressively increases intensity as the test continues.<sup>20</sup> The total number of shuttles successfully completed was recorded as the PACER score.<sup>21</sup> The PACER has previously demonstrated strong test-retest reliability and criterion-referenced validity.<sup>22</sup>

#### 3. Push-Up:

Following ACSM testing guidelines, participants were instructed to complete as many push-ups as possible at a comfortable pace without resting.<sup>19</sup> Males completed a standard push-up form, and females completed a modified push-up form in accordance with ACSM protocol.<sup>19</sup> The total number of push-ups completed with proper form and without rest was recorded as their push-up score.

#### 4. Plank:

Participants were instructed to hold a plank position with correct form for as long as they possibly could. Performance for the plank assessment was recorded as the total number of seconds the participant successfully held a proper plank position. Researchers have identified that the plank has a strong test-retest reliability<sup>23</sup> and is a viable assessment for assessing core muscle endurance.

#### Verbal Encouragement

Standardized VE phrases were created by study investigators utilizing an AGT theoretical framework, either focusing on a mastery or performance motivational climate. VE scripts were developed with three reviewers and were informed by AGT and commonly used VE phrases published in the literature.<sup>3,7,24,25</sup> Alignment with the intended constructs (mastery or performance) were assessed through a review process, and scripts were refined prior to implementation. While certain VE phrases included overlapping components (e.g., “Let’s go! Set a new PR!” – mastery or “Let’s go! Set a new participant record!” – performance), the primary emphasis of each phrase was intentionally framed as either mastery- or performance-focused. VE was given during the experimental visits and were based on either a mastery or a performance motivational climate or no VE (Table 1). Researchers utilized participants baseline performance during each of the 4 tasks to personalize VE given during visit 3 and 4. During the 1RM assessment, VE was provided right before the participant began the lift (both warm-up and maximal attempts), half-way through the movement, and during rest periods. During the PACER, push-up, and plank assessments, VE was provided every 20 seconds which is consistent with previous literature.<sup>25</sup> Following the final exercise assessment, participants completed a manipulation check survey and a perception of VE survey. Manipulation check questions assessed whether the participant 1) was given verbal feedback, 2) if feedback was focused on self-improvement, 3) if feedback focused on performing better than others, and 4) selecting specific VE phrases that were given during their experimental exercise sessions.

**Table 1.** Verbal encouragement phrase description and examples.

Experimental Group	Description	Example
Mastery Verbal Encouragement	<ul style="list-style-type: none"> <li>· Review baseline visit performance</li> <li>· Emphasized personal improvement</li> <li>· Emphasized task improvement</li> <li>· Performance improvements relative to baseline visit</li> </ul>	<ul style="list-style-type: none"> <li>· "You completed <math>x</math> push-ups at baseline, we want you to push beyond that!"</li> <li>· "Let's Go! Set a new PR!"</li> <li>· "Push it! You can do better than last time!"</li> </ul>
Performance Verbal Encouragement	<ul style="list-style-type: none"> <li>· Review above average &amp; superior normative standards for age/sex</li> <li>· Emphasize performing better than the average norm</li> <li>· Emphasize performing better than other participants</li> </ul>	<ul style="list-style-type: none"> <li>· "The average individual can do <math>x</math> push-ups, we want you to do better!"</li> <li>· "Let's Go! Set a new participant record!"</li> <li>· "Push it! You can be the best!"</li> </ul>
Control	<ul style="list-style-type: none"> <li>· No verbal encouragement was given</li> </ul>	<ul style="list-style-type: none"> <li>· Not applicable</li> </ul>

#### Statistical Analysis

Data was analyzed using IBM SPSS 27 (IBN Corp., Somers, NY) with an alpha value of  $p < 0.05$  for all analyses. Cronbach’s Alpha was utilized to assess GOEM internal consistency reliability.<sup>26</sup> Mastery GOEM questions had an acceptable reliability (0.701), and performance GOEM questions had a good reliability (0.815). Independent samples t-tests were conducted to compare

the combined VE groups to the control group to examine the overall impact of VE on exercise performance. Levene's test for equality of variance was performed and if group variances were unequal, Welch's t-test was employed. To test if there were differences between VE groups, a repeated measures ANOVA with a within-subjects factor of 'study visit' and a between-subjects factor of 'VE group' examined exercise performance differences between baseline and experimental visits. A between subjects' factor of 'sex' was added to test if sex differences existed. Covariates were evaluated for statistical significance, including experience and confidence with exercise assessments, and goal orientation. Main effects were compared for repeated measures ANOVA using Bonferroni confidence interval adjustments and effect size was determined by calculated with partial eta-squared.

## Results

Of the 75 participants who began the study, 15 discontinued due to scheduling conflicts or disinterest (11% dropout rate), leaving a total of 60 participants with complete data (female:  $n=41$ , male:  $n=19$ ) (Figure 2). The results presented only include participants with complete data. Participant characteristics by experimental group are displayed in Table 2 (mean  $\pm$  SD; age:  $20.5 \pm 2.3$  years; height:  $167 \pm 10$  cm; body mass:  $71.8 \pm 15.6$  kg). Most participants were Caucasian (68.3%), reported being physically active prior to participation (81%), and were mastery goal-oriented (96.6%). The majority of participants (62.5%) reported previous participation in team sports with soccer (45%), basketball (27.5%) and volleyball (22.5%) being the most commonly played. No significant differences in prior sport participation were observed among VE groups. Most participants reported high confidence and experience with the included assessments, suggesting minimal learning or novelty effects.

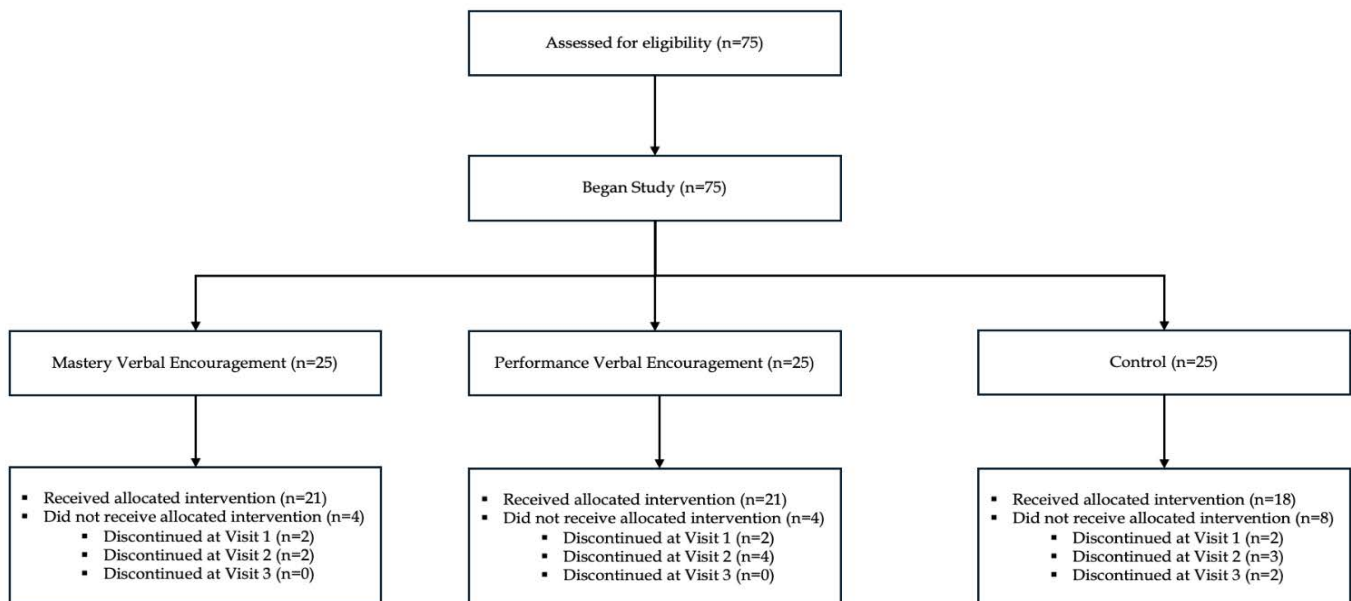


Figure 2. CONSORT Flow Diagram

**Table 2.** Descriptive Statistics by Verbal Encouragement Group.

Variable	Mastery VE	Performance VE	Control
Sex (N, %)			
Male	7 (33.3)	8 (38.1)	5 (22.2)
Female	14 (66.7)	13 (61.9)	13 (72.2)
Age (M ± SD)	21 ± 3.2	20 ± 2.1	20 ± 0.87
Body Mass (kg)			
Male	86.5 ± 22.0	76.8 ± 12.1	78.5 ± 8.0
Female	71.0 ± 12.4	70.7 ± 9.4	61.0 ± 16.4
Physically Active (yes) (N, %)	20 (95.2)	15 (68.2)*	13 (76.5)†
Experience (M ± SD)			
1RM	5.3 ± 3.7	5.9 ± 3.3	4.5 ± 2.9
PACER	6.8 ± 2.5	7.0 ± 2.9	6.9 ± 2.9
Push-Up	8.2 ± 1.6	7.7 ± 2.4	7.6 ± 2.1
Plank	8.8 ± 1.1	8.0 ± 1.7	8.0 ± 1.8
Confidence (M ± SD)			
1RM	5.9 ± 3.4	5.7 ± 3.3	5.7 ± 2.5
PACER	6.7 ± 2.2	6.9 ± 2.5	6.0 ± 3.1
Push-Up	5.9 ± 2.6	6.5 ± 2.8	6.4 ± 2.5
Plank	7.3 ± 2.2	7.4 ± 2.1	7.1 ± 2.1

Note: \* indicates significance at  $p < 0.05$  between MVE and PVE, † indicates significance at  $p < 0.05$  between MVE and CVE, and # indicates significance at  $p < 0.05$  between PVE and CVE. Experience and confidence was assessed with a self-report 10-point rating scale, with 10 being very experienced/very confident.

### Manipulation Check & Perceptions of Verbal Encouragement

In MVE and PVE groups, all participants (100%) successfully recognized that VE was given and the majority (88.9%) of those in C successfully recognized that no VE was given. When asked if VE was given relative to their baseline assessments (MVE), 90.5% of MVE participants correctly identified they received MVE, while 85.7% of PVE participants incorrectly selected MVE options. A similar trend was observed when assessing if the participant received VE relative to peer or normative performance (PVE), with 90.5% of PVE participants correctly identifying they received PVE while 81% of MVE participants incorrectly selecting PVE. A majority (66.7%) of MVE and PVE participants successfully selected some correct MVE or PVE phrases, respectively. In both MVE and PVE groups, 14.3% of participants selected both correct and incorrect verbal phrases related to their experimental condition. The variability in participant ability to accurately attribute encouragement as mastery or performance suggests that participants were not able to distinguish the theoretical distinction between mastery and performance VE. Therefore, the two VE conditions were also combined into one group for statistical analyses.

### Exercise Performance

Both VE groups were first combined and compared to the control group using independent  $t$  tests to assess the overall effect of VE compared to the control group. There were no significant differences for the 1RM bench press ( $t(56) = 0.97, p = 0.17$ ) or PACER ( $t(57) = 1.58, p = 0.059$ ). However, VE was significantly improved for push-up performance ( $t(58) = 2.20, p = 0.045$ ;  $+6.4 \pm 5.3$  push-ups) and plank ( $t(58) = 5.05, p < 0.001$ ;  $+36.2 \pm 30.0$  sec) compared to control ( $+2.3 \pm 9.0$  push-ups and  $-4.0 \pm 20.6$  seconds).

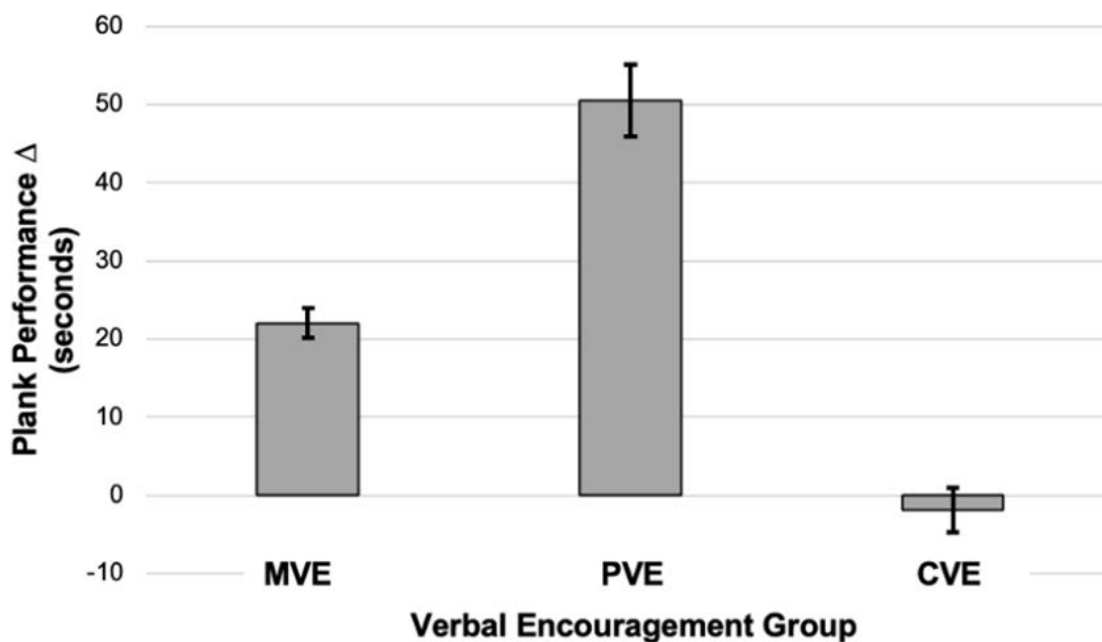
Repeated measures ANOVA tested if performance differed between MVE, PVE, and control groups. No significant differences in exercise performance measures existed among the three VE

groups at baseline (Table 3). Covariates had no significant effects for plank, 1RM bench press, PACER, or push-up. Given the absence of significant effects for all performance measures, these variables were excluded as covariates in subsequent analyses. There were significant differences among VE groups x visit for the plank ( $F(2,57)=20.39$ ,  $p<0.001$ ,  $\eta^2=0.47$ ), but no other exercise task (Table 3). Post-hoc analyses indicated a significant difference in plank performance between PVE and MVE groups ( $p=0.002$ ), with the PVE group showing a greater increase ( $+50.5 \pm 35.6$ ) compared to the MVE group ( $+22.0 \pm 14.7$  seconds) (Figure 3). Significant differences also existed between MVE and the C group ( $p=0.015$ ), with MVE increasing plank performance significantly more than the C group ( $-1.9 \pm 21.7$  seconds) (Figure 3). Significant differences were observed between PVE and C groups ( $p<0.001$ ) (Figure 3). A between subjects' factor of 'sex' was added to investigate potential differences in exercise performance by sex. No significant differences between sex were identified.

**Table 3.** Exercise Performance at Baseline and Experimental Phase by Verbal Encouragement Group (M +/- SD).

Performance Outcome	Mastery VE	Performance VE	Control
1RM Bench Press (lbs)			
Baseline	115 ± 65.9	114.5 ± 47.3	99.7 ± 54.6
Experimental	120 ± 64.9	118.6 ± 47.3	102.3 ± 57.0
PACER (# of shuttles)			
Baseline	35.4 ± 21.8	41.3 ± 31.5	30.8 ± 57.0
Experimental	38.9 ± 23.4	45.4 ± 31.9	32.0 ± 10.3
Push-up (# of repetitions)			
Baseline	24.9 ± 12.8	24.0 ± 9.8	26.8 ± 12.3
Experimental	31.7 ± 14.8	30.0 ± 8.9	29.6 ± 12.9
Plank (seconds)			
Baseline	102.1 ± 50.2	106.7 ± 58.5	104.1 ± 45.5
Experimental	124.1 ± 59.0 <sup>*</sup>	157.2 ± 85.1 <sup>#</sup>	102.2 ± 33.9

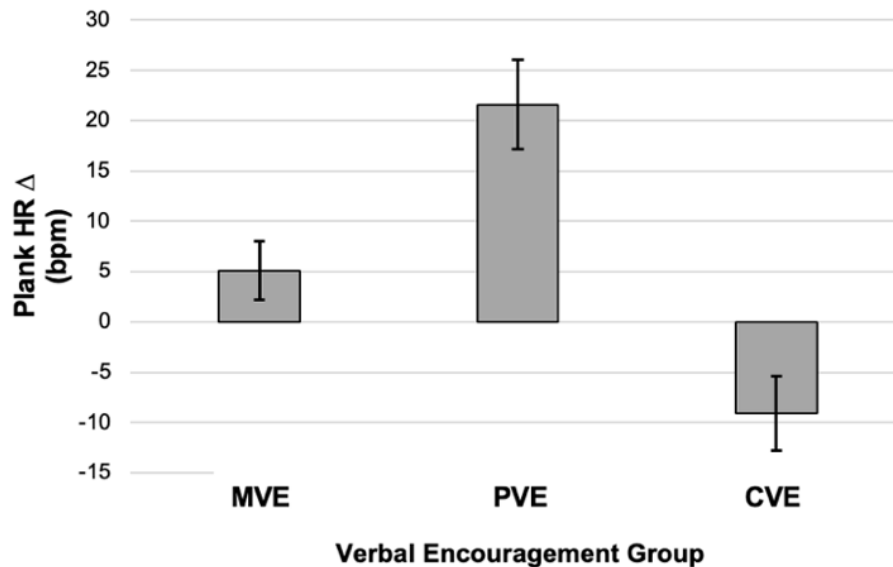
Note: \* indicates significance at  $p<0.05$  between MVE and PVE, <sup>†</sup> indicates significance at  $p<0.05$  between MVE and control, and <sup>#</sup> indicates significance at  $p<0.05$  between PVE and control.



**Figure 3.** Plank Performance change (Pre-Post) by VE group.

### Post-Exercise Heart Rate

No significant post-exercise HR differences existed for the push-up, PACER, or 1RM bench press by VE group. Significant differences in plank post-exercise HR were found between VE groups ( $F(2,56)=6.405, p=0.003$ ) and post-hoc tests identified plank recovery HR was significantly higher in the PVE group compared to C ( $p=0.002$ ), but no other groups (Figure 4).



**Figure 4.** Plank Recovery HR change by VE Group (Pre-Post).

### Discussion

The aim of the current study was to observe the effect of theoretical based VE (mastery and performance) on 1RM bench press, push-up, PACER, and plank exercise performance. We identified that response to VE may differ by exercise task type (dynamic muscular strength, cardiorespiratory performance, isometric muscular endurance, and dynamic muscular endurance). VE groups performed better than control on push up and plank exercises. Results for the different types of VE were not expected as the PVE group outperformed both MVE and control on the plank, but did not differ on other performance assessments. Despite all participants in both MVE and PVE groups successfully selecting that they received VE during the manipulation check, not all participants could differentiate key aspects of VE phrases that differentiated VE between being mastery or performance based. However, as an objective physiological manipulation check, post-exercise HR response aligned with significant improvements in task performance. These findings suggest that VE had a direct response on participant effort, even if they could not clearly differentiate between PVE and MVE on the post-exercise questionnaire.

Incongruent with previous research,<sup>5-7,9,25,27</sup> the current study identified no significant performance improvements for either the 1RM bench press (dynamic muscular strength) or PACER (cardiorespiratory performance). For instance, other research examining VE and cardiorespiratory performance has highlighted improvements in relative  $VO_2 \max$ <sup>9,25</sup> and exercise duration.<sup>7,9,25,27</sup> These studies overall have smaller sample sizes ( $N=12 - 28$ ) and utilized either a treadmill or a bike, which may contribute to inconsistent findings.<sup>7,9,25,27</sup> In the context of muscular strength,

studies have shown positive impacts of VE on mean peak force.<sup>5,6</sup> However, more recently Lee and colleagues (2021) identified that VE was insufficient at increasing mean peak force over the course.<sup>28</sup> Importantly, Lee and colleagues had a larger sample size (n=65), similar to the present study (n=60) compared to McNair et al., 1996 (n=20), which may contribute to inconsistent findings.<sup>6,28</sup>

Our study identified a significant improvement in time spent in the plank position and the number of push-ups successfully completed among participants that received VE. Similarly, Bickers and McNair et al., demonstrated that VE significantly improved concentric and isokinetic muscle performance during a single leg holding task and mean peak force.<sup>5,6</sup> Our results extend this by identifying differences in plank performance by type of VE, and that performance centered VE may be most optimal at improving plank performance. In the context of AGT, a performance motivational climate has been associated with improved performance in short duration sport tasks.<sup>29</sup> These authors also identified a mediating effect of goal orientation on sport task performance,<sup>29</sup> whereas the present study identified no effect of goal orientation on exercise task performance. Further, mastery motivational climates are often more related to overall growth and the personal improvements motivation,<sup>11,14</sup> and while this may be important for longevity in exercise and sport, this climate may not be the most optimal at increasing acute exercise performance. Exercise and sport are inherently competitive, and it is possible that previous experiences with coaches over the lifespan have shaped the way that they respond to certain types of VE. During longer or more demanding activities, VE may serve as a distraction from discomfort or fatigue,<sup>30</sup> potentially explaining why VE had a greater impact on the plank and push-up compared to 1RM bench press.

Our study is among the first to create theory-based VE phrases and investigate their effects on exercise performance. This study is strengthened by the use of field tests that are readily available, increasing the feasibility of replicating the current study in other settings. Although the study provides valuable insights on the benefits of providing VE, certain limitations should be acknowledged. While research assistants for this study were trained thoroughly to administer VE and constantly observed by the study coordinator, it is possible that some variation in VE or voice levels occurred. The different interpretations of the VE suggest incongruency between the intention and perception. Another limitation is the relatively young, healthy, and active sample, which may lead to a unique effect of VE on task performance and limit the generalizability of the findings to other populations. Further, caution should be used in interpreting results regarding the type of VE because although participants could accurately identify their own condition, some participants incorrectly identified encouragement in the other VE condition. Recognition memory for external cues has been shown to decline as exercise intensity rises, likely due to attentional narrowing from exercise demands.<sup>31</sup> Thus, it is possible that recognition memory of the given VE phrases was impeded due to the demands of the exercise testing (e.g. 1RM effort).

Future research may consider employing quantitative and qualitative measures in response to VE to further our understanding of physical and psychological responses to VE. Our findings suggest that PVE may impact plank performance in a different manner than MVE, thus warranting further investigation. Additional research is needed to understand how VE may differ by task, and VE may be improved by strategically planning VE around key moments of fatigue.

### **Conclusion**

This study represents one of the first to identify exercise task performance differences between theory-driven VE phrases. Altogether, we identified that specific VE phrasing may be helpful

to improving specific exercise task performance, which has not been previously investigated in VE literature. These findings suggest that in the context of isometric and dynamic muscular endurance, VE may serve as a useful tool to improve acute exercise performance. However, care should be taken to make sure the intended meaning is accurately conveyed. Overall, our findings further our understanding into how VE impact exercise performance and may be particularly helpful in designing more effective exercise programs for populations who may experience lower motivation to complete exercise tasks at greater intensities. VE appears to be a simple, yet effective tool for enhancing athletic performance.

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