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Brief Report

Effects of Inner Monologue Swearing on Physical Performance

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Abstract

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There is compelling evidence that verbalizing swear words out loud increases physical performance. However, from a practical standpoint, verbal swearing may not always be feasible in public settings. One potential alternative is the use of inner monologue swearing (i.e. verbalizing in one's mind), which could extend the utility of swearing to environments where vocalizing profanity is restricted. This study investigated whether inner monologue swearing enhances physical performance using a randomized crossover design. Forty-two physically active individuals were recruited for the study. Each participant completed two separate visits, spaced at least 72 hours apart to allow for recovery. During each visit, participants repeated, using inner monologue, either a swear word or neutral word every five seconds while completing three exercise tests in sequence: 1) grip strength, 2) wall sit time to exhaustion, and 3) plank time to exhaustion. Results indicate no significant difference in grip strength between swearing and neutral word conditions (p = 0.998). However, inner monologue swearing significantly improved wall sit (p = 0.008) and plank (p = 0.008) time to exhaustion compared to the neutral word using condition. These findings provide novel evidence that inner monologue swearing may enhance muscular endurance. However, the absence of a similar effect on grip strength suggests that this benefit may be task specific. These results have important practical implications, suggesting that inner monologue swearing may serve as a viable strategy to enhance physical performance in public settings where vocal swearing is not an option.

Keywords: Cursing, exercise, grip strength, wall sit, plank

Introduction

Swearing, or the use of potentially offensive taboo words,[1] has been shown to produce positive physiological, psychological, and social effects.[2] While it's a new area of investigation, swearing has been repeatedly shown to improve physical performance. Stephens et al[3] found that repeating a swear word out loud increased peak and average power during a Wingate Anaerobic Power Test by an average of 4.5% and improved grip strength by an average of 8% compared

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to repeating a non-swear word. Stephens et al[4] conducted a replication study on the effects of swearing out loud versus repeating a neutral word on grip strength and, again, found swearing improved grip strength by an average of 8%. Another experiment by Stephens et al[4] examined the effects of swearing out loud on a chair push-up task, which is a body weight exercise requiring participants to raise their bodies and support their body weight on their hands and arms against the chair seat for as long as possible. Swearing out loud allowed participants to hold the chair push-up position for 10% longer, as compared to repeating a neutral word.[4] Jiannine and Antonio[5] investigated how swearing out loud affects physical performance during grip strength, push-ups to fatigue, and wall sit exercise and plank exercise time to exhaustion. Participants repeated a swear word out loud every five seconds while performing these tasks. The results showed significant performance enhancements, as swearing out loud, compared to repeating a control word, was associated with enhanced grip strength by 9%, push-ups to failure by 15%, wall sit time by 22%, and plank time by 12%.[5] Collectively, these studies provide compelling evidence that swearing out loud enhances performance on relatively short, intense physical tasks.[6]

From a practical standpoint, swearing out loud during a physical performance task may not be feasible for all individuals in all situations. The taboo nature of swearing may limit its utility in real-world situations. Many public fitness centers and athletic competition settings prohibit offensive behavior, including swearing. For example, the National Collegiate Athletic Association (NCAA), a multibillion dollar industry[7] that invests a lot of money to gain a competitive edge,[8] explicitly prohibits swearing. The NCAA football rulebook states that no player "shall use abusive, threatening or obscene language" and classifies such behavior as unsportsmanlike conduct that is subject to penalty or ejection.[9] Although vocal swearing is linked to enhanced physical performance, the simple modification of using inner monologue swearing (i.e., self-talk swearing) may ultimately lead to a greater utility of swearing for enhanced physical performance in real-world settings. However, the effects of inner monologue swearing on physical performance has not yet been explored by empirical research. Therefore, the primary purpose of this study was to investigate how inner monologue swearing influences physical performance. It was hypothesized that inner monologue swearing would enhance performance on exercise tests, including grip strength, wall sit time to exhaustion, and plank time to exhaustion.

Methods

Participants

To inform an adequate sample size, an a priori power analysis was conducted using G-power 3.1.9.6 open access software.[10] A previous investigation by Stephens et al[3] showed swearing decreased fatigue (power drop) indices during exercise with a d = 0.446. Therefore, based on Stephens et al's[3] findings, the following parameters were used: t-test (matched pairs); d = 0.446; α= 0.05; 1-β= 0.80; two-tailed test (non-directional). This yielded an appropriate sample size of n = 42. Accordingly, a total of 42 physically active participants (19 females, 23 males; age 20.9 ± 0.94 years) were recruited from the Nova Southeastern University community using a convenience sampling method. Participants were classified as physically active if they engaged in at least 150 minutes/week of moderate-intensity exercise.[11] Only students who met this specific physical activity criterion, based on self-report, were eligible to participate in the study. Participants also completed the physical activity readiness questionnaire[12] (PAR-Q) to screen for the safety of

exercise that was required prior to participation. Participants were excluded if they had diabetes, cancer, heart disease, or any other injury or illness limiting exercise capacity. Participants were instructed to refrain from performing strenuous activity 24 hours prior to testing and to avoid consuming caffeine or pre-workout supplements for 12 hours before testing. No specific guidelines were provided regarding meal consumption or hydration status before testing. Written informed consent was obtained from all participants prior to their engagement in the study, and all procedures and experimentation were approved by Nova Southeastern University's institutional review board, approval number 2024-391. This research was carried out fully in accordance with the ethical standards of the *International Journal of Exercise Science*.[13]

Protocol

This study utilized a randomized counterbalanced design, in which all participants (n = 42) completed two counterbalanced laboratory visits, each involving a different condition: 1) a neutral word (NW) and a swear word (SW). A minimum washout period of 72 hours separated the two visits to minimize carryover effects. Previous crossover experiments investigating the effects of swearing out loud on physical performance have required participants to complete both conditions with the same session[3,4] (Stephens et al. 2018, 2023), and given that 48 hours is generally sufficient for full recovery following exercise,[14] a 72-hour interval was selected as a conservative washout period. During the initial visit, after written informed consent was obtained, participants were asked to identify a swear word they would typically use if they were to stub their toe, consistent with procedures used in previous research.[4,5] Depending on randomization order, participants either repeated their self-selected swear word (SW) or a neutral word (NW) provided by the researchers. Each neutral word was matched to the participant's SW in sound and syllable count to control for phonetic characteristics such as plosiveness.[5] The neutral words included fuck à fudge, bitch à bean, mother fucker à mother fudger, shit à shoot, damn à darn, fucking cunt à fudging corn, and fucker à fudger. Although some neutral words were euphemistic in nature (e.g., fudge, shoot) and may carry mild negative connotations, prior research demonstrated that genuine swear words elicit greater physiological arousal than both euphemisms and aversive non-swear words,[15,16] supporting the use of these substitutions as appropriate neutral controls. Each participant completed three exercise tests in sequence for both conditions: 1) a grip strength test, 2) a wall sit exercise to exhaustion, and 3) a plank exercise to exhaustion. For the wall sit and plank exercises, 'to exhaustion' was defined as when the participant reached volitional fatigue or could no longer maintain proper form during those exercises. During the three exercise tests, participants were instructed to silently repeat either their SW or NW every 5 seconds[5] using inner monologue. To promote adherence to this timing, a metronome provided an audible beat every 5 seconds. Beyond this, the researchers did not offer verbal encouragement or additional reminders to continue the inner monologue. Participants were instructed in proper exercise form prior to testing; however, no additional familiarization sessions were conducted. The researcher provided form correction instructions as needed during testing, but no trials were terminated due to an inability to maintain proper form. Rather all participants ended testing due to volitional fatigue. Efforts were made to ensure consistency in form monitoring across participants and experimental conditions. Additionally, participants were blinded to their grip strength and time to exhaustion during the performance testing.

Grip Strength.

Grip strength was measured in kilograms using the Jamar® hand dynamometer (J. A. Preston Corporation, Clifton, NJ). Data collection followed the standard procedures recommended by the American Society of Hand Therapists.[17] Participants were seated with their shoulders adducted and neutrally rotated, elbows flexed to 90°, forearms in neutral rotation and wrists either neutral or slightly extended with ulnar deviation. Grip strength was assessed in the dominant hand, with participants instructed to squeeze the dynamometer as hard as possible for up to 10 seconds. Participants performed three grip strength attempts with the highest force recorded in kilograms.

Wall Sit Exercise to Exhaustion.

Participants were instructed to hold a wall sit position for as long as possible, with time recorded in seconds. To begin, they assume the standardized testing position, ensuring the entire length of their spine remained in contact with the wall. Their feet were placed shoulder width apart, approximately 2 feet away from the wall, with hips and knees flexed to 90°, thighs parallel to the ground, and shins vertical. Participants were instructed to have their arms resting at their sides throughout the test. Time began once the participant achieved the correct position and ended when they reached volitional fatigue or could no longer maintain proper form.

Plank Exercise to Exhaustion.

Participants were instructed to hold a position for as long as possible, with time recorded in seconds. To begin, they assumed a prone position on the floor, supporting their body with their forearms and toes. The elbows were positioned directly under their shoulders, flexed to 90°, with forearms parallel to each other and feet hip width apart. Participants were required to maintain a neutral spine, ensuring proper alignment of head, neck, and back, while preventing the hip from sagging downward or elevating. Time began once the participant assumed the correct position and ended when they reached volitional fatigue or could no longer maintain proper form.

Statistical Analysis

All data were analyzed using Jamovi software (Version 2.3; Sydney, Australia). To confirm normality of data, the Shapiro-Wilk method was used. Means from each condition were compared using a two-sided pairwise *t*-test. Effect sizes between means were calculated via Cohen's *d* and interpreted as: 0.2 – small; 0.5 – moderate; 0.8 – large.[18,19] All data are presented as mean ± standard deviation (*SD*). Significance was set at $p \leq 0.05$ a priori.

Results

Results for grip strength (kg), wall sit (s), and plank (s) exercise tests are shown in **Figure 1**. Findings showed no differences in the observed grip strength (NW = 49.1 ± 3.25 kg, SW = 49.1 ± 3.19 kg; $p = 0.998$; $d < 0.01$; **Figure 1a**) between inner monologue swearing and neutral word conditions. However, wall sit time to exhaustion was improved by inner monologue swearing versus the neutral word condition (NW = 88.0 ± 31.9 s, SW = 105.7 ± 46.7 s; $p = 0.008$; $d = 0.42$; **Figure 1b**). Furthermore, plank time to exhaustion was improved with inner monologue swearing use compared to repeating a neutral word (NW = 108.0 ± 36.7 s, SW = 127.0 ± 48.9 s; $p = 0.008$; $d = 0.43$; **Figure 1c**).

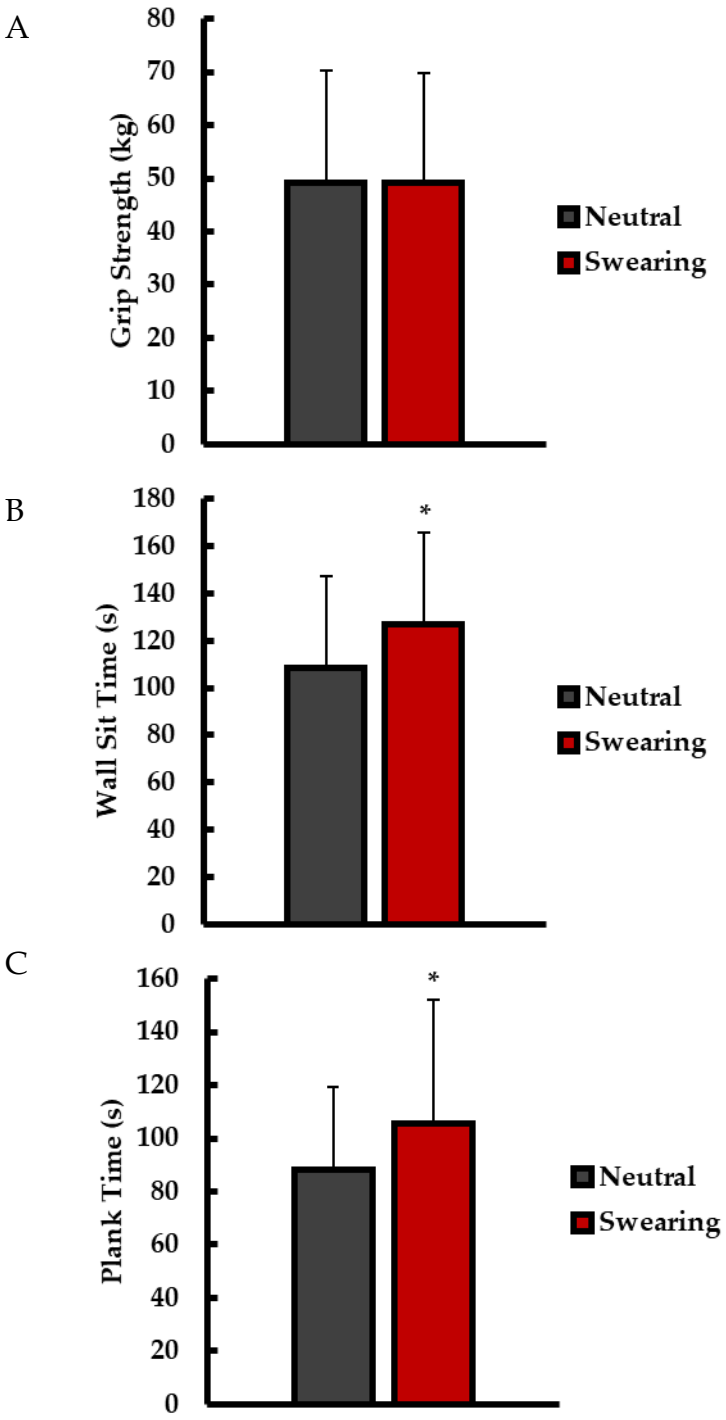

Figure 1. Performance outcomes of a) grip strength (kg), b) wall sit time (s), and c) plank time (s) Data are presented as mean ± SD. *indicates significantly different than neutral (p<0.05).

Discussion

To the authors' knowledge, this study is the first to investigate the effects of inner monologue swearing on physical performance. Previous research has demonstrated that swearing out loud enhances physical performance,[6] but it remained unclear whether similar effects would occur when swearing was restricted to an inner monologue (i.e., self-talk). The present findings suggest

that inner monologue swearing may positively influence physical performance, particularly muscle endurance, as indicated by improved performance in the wall sit and plank exercises. However, inner monologue swearing did not significantly affect muscle strength, as measured by grip strength.

Inner monologue is widely used among athletes, with more than 85% reporting that they engage with some form of self-talk, and most believe it enhances performance.[20] Evidence supports self-talk as an effective strategy for improving physical performance.[21,22] Building on this foundation, the present study contributes novel empirical findings by investigating whether inner monologue swearing, as a distinct form of self-talk, can produce similar benefits.

The present findings partially align with Jiannine and Antonio,[5] who found swearing out loud positively influenced performance on wall sit and plank exercises. However, unlike prior research showing swearing out loud was associated with increased grip strength,[3,5] the present study found no such effect when swearing was restricted to inner monologue. This discrepancy suggests that the mode of swearing, out loud versus internal, may play a crucial role in determining its effects on physical performance. One potential explanation for the absence of grip strength improvement in the inner monologue condition is dosage, specifically the frequency with which participants swore. Dosage is a known factor in interventions aimed at improving physical performance[23,24] and may also influence the effects of swearing.[6] In this study, participants were instructed to repeat their selected word internally every 5 seconds, following the protocol used by Jiannine and Antonio.[5] During the brief grip strength test, this resulted in an average of only two repetitions of inner monologue swearing, whereas significantly higher repetitions were recorded during the endurance-based tasks (mean of 21 repetitions for wall sit; 25 repetitions for plank). This suggests the possible existence of a minimal threshold of inner monologue swearing required before performance benefits emerge. Furthermore, the fact that swearing out loud every 5 seconds was associated with improved grip strength in prior research,[5] while inner monologue swearing at the same interval did not, points to a possible difference in the dose-response relationship between overt and internal swearing. It may be that inner monologue swearing requires a higher frequency or longer duration to achieve similar effects. Another explanation concerns the functional differences between the tested exercises. Grip strength primarily measures maximal muscular force output, whereas the wall sit and plank exercises assess muscle endurance, the capacity to sustain contractions over time. If inner monologue swearing preferentially enhances endurance-based performance, this could account for the significant improvements observed in the wall sit and plank exercises, but not in grip strength. However, given that self-talk, in general, has been shown to enhance performance across a broad spectrum of tasks,[22] an explanation grounded solely in the functional differences between these exercises appears less plausibility.

While the precise mechanisms by which swearing out loud enhances physical performance remain unclear, several psychophysiological effects have been identified that may contribute to its ergogenic potential. Swearing out loud has been shown to increase sympathetic nervous system activation,[16] elevate self-confidence,[4] promote psychological flow,[4] and activates the behavioral activation system.[25] Swearing out loud has also been associated with increased pain threshold and pain tolerance.[26] Collectively, these swearing-induced effects represent plausible mechanisms underlying performance enhancement, whether the swearing occurs externally

or internally. Findings from the present study, where inner monologue swearing improved performance on endurance-based tasks but not strength-based performance, invite speculation about the potential mechanisms of internal swearing. During endurance exercise, such as wall sits or planks, inner monologue swearing may have provided sufficient time for individuals to enter a state of psychological flow, leading to sustained performance. In contrast, the brief duration of the strength-based grip task may not have allowed adequate time for such a state to develop. Furthermore, endurance-based tasks are generally more painful than brief strength-based efforts.[27] If pain modulation is a key mechanism by which inner monologue swearing enhances performance, then reduced pain perception during endurance task may have made them more tolerable, enabling participants to persist longer. In contrast, the grip strength task likely did not elicit enough discomfort to benefit from the same pain-modulating effects. This interpretation aligns with evidence that other pain-reducing interventions, such as acetaminophen, can decrease pain and improve endurance performance.[28]

Ultimately, the present findings advance training knowledge and practice in that inner monologue swearing may selectively benefit endurance-based tasks or require a minimal dosage threshold to exert an effect. These explanations remain speculative, and future research is needed to substantiate these claims. Nevertheless, swearing out loud is associated with improved muscular strength and muscular endurance,[6] while the present findings suggest that inner monologue may be more nuanced.

While this study provides novel insights into the impact of inner monologue swearing on physical performance, several limitations should be noted. The relatively small and homogeneous sample, consisting of physically active university students, limits the generalizability of the findings. Future research should aim to replicate these findings using larger and more diverse samples to better understand the effects of inner monologue swearing on physical performance. Additionally, a fundamental limitation of inner monologue research is the inability to fully monitor or verify participants' inner speech, making it difficult to ensure consistent adherence to the intended intervention. Expanding the range of performance tasks tested may help clarify the conditions under which inner monologue swearing enhances physical performance. A particularly valuable avenue for future research is the direct comparison of swearing out loud versus inner monologue swearing, as well as comparisons between inner monologue swearing and traditional forms of self-talk (e.g., "you've got this"). Moreover, future studies should also evaluate *how* swearing impacts performance, not just *if* swearing is beneficial. Taken together, these limitations and recommendations highlight the need for further research to delineate not only if inner monologue swearing enhances performance, but also how, under what conditions, and for whom such effects are most pronounced.

In conclusion, this study provides novel evidence that inner monologue swearing may enhance muscle endurance, as demonstrated by improved performance in the wall sit and plank exercise tests. However, the absence of similar effects on grip strength suggests that the benefits of inner monologue swearing may be task or dose specific, highlighting existing gaps in understanding and the need for further research. These findings build upon prior research demonstrating the performance-enhancing effects of swearing out loud during physical tasks and suggests that inner monologue swearing may serve as a practical alternative in situations where vocalizing swear words is inappropriate or impractical.

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