

University of Nevada, Reno

Stay Calm and Plank On:

An analysis of verbal interventions to increase task persistence in runners

A thesis submitted in partial fulfillment of the requirements for the degree of Master of
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By

Ashlie J. Encinias

Dr. Steven C. Hayes / Thesis Advisor

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prepared under our supervision by

Ashlie J. Encinias

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be accepted in partial fulfillment of the
requirements for the degree of

Master of Science

Steven C. Hayes, Ph.D.
Advisor

Ramona Housmanfar, Ph.D.
Co-advisor

Yani Dickens, Ph.D.
Graduate School Representative

David W. Zeh, Ph.D., Dean
Graduate School

Abstract

Covert verbal behavior is often said to play a key role in the success of athletic performance. Not much research of this kind has been completed in the field of behavior analysis. Acceptance and Commitment Training (ACT) and Relational Frame Theory (RFT) provide tools to study this aspect of athleticism. This study investigates the use of two ACT intervention components, acceptance and defusion, on increasing runners' perseverance holding a forearm plank. A within-subject, alternating treatments design was used to examine runners across a range of athletic fitness to observe how acceptance and defusion techniques might effect a difficult training task given various levels of athleticism. Graphical and inferential statistical analyses suggested that both intervention conditions increased all three classes of runners' plank holds over their baseline performance.

Key words: Acceptance and Commitment Training, Acceptance and Commitment Therapy, acceptance, defusion, Relational Frame Theory, athletes, runners

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Introduction

An athlete's task persistence is a key component in their performance. Although task persistence can be determined by many variables, a possible link to covert verbal behavior is reflected in the colloquial label for task persistence: mental toughness. Olympic runners such as Shalane Flanagan, Desiree Linden, and Stephen Scullion, to name a few, have spoken about the need to have mental toughness in races. It is said to determine how hard a runner pushes themselves in training, and how they respond to "hitting the wall" in races. It is often viewed as a factor in the difference between crossing the finish line or conceding a did not finish (DNF).

Covert verbal behavior is a relatively uncommon research focus of behavior analysts in the area of sports, but it is more frequently so in clinical domains. Over the last few decades Relational Frame Theory (RFT; Hayes, S., Barnes-Holmes, & Roche, 2001) and Acceptance and Commitment Training (ACT; Hayes, Strosahl, & Wilson, 2012) have been used by behavior analytic researchers to address verbal behavior that occurs under various conditions, including the impact on task persistence of athletes. Before reviewing that work a brief description of RFT and ACT is in order.

Relational Frame Theory

Relational Frame Theory (RFT) analyzes human language and cognition on the basis of learned relational responses that can be regulated by arbitrary contextual cues (Hayes, Barnes-Holmes, & Roche, 2001). RFT provides a functional account of the conditions under which verbal stimuli come to have behavioral effects and provides an analysis of when and how verbal rules impact behavior. According to RFT, there are

three distinct classes of rule-governed behavior: pliance, tracking, and augmenting. Verbal motivational effects, such as those involved in sports performance, are dominantly the domain of augmentals.

Augmenting is rule-governed behavior based on relational networks that alter the degree to which events function as consequences (Hayes, Barnes-Holmes, & Roche, 2001). Augmentals alter the function or strength of a consequence and can be further broken down into formative augmentals and motivative augmentals. Formative augmentals are relational networks that establish a given consequence as reinforcers or punishers, changing previously neutral stimuli into effective operant consequences. Motivative augmentals are relational networks that temporarily alter the degree to which previously established consequences function as reinforcers or punishers. This study aims to investigate verbal instructions that may be interpreted as the effects of motivative augmentals on a runner's endurance to perform training tasks.

Acceptance and Commitment Training: Training for Psychological Flexibility

Acceptance and Commitment Training or Therapy (ACT) is an extension of RFT that is designed to produce more flexible and effective repertoires (Hayes, S., 2004). ACT focuses on the strengthening of *psychological flexibility*, the capacity to contact the current external and internal situation and the private events it may contain and to persist in actions that produce valued consequences. In the psychological flexibility model, task persistence can be disrupted by private events such as feelings and thoughts for multiple reasons. One is experiential avoidance, which is defined as an attempt to escape or avoid private events such as emotions or sensations even when

the attempt to do so causes psychological harm (Hayes, S., 2004). A vast literature shows that experiential avoidance undermines needed task persistence (see Hayes, S., 2019 for a recent review) in part because avoiding or suppressing these private events may paradoxically increase their occurrence and behavioral impact. A second source of disruption of task persistence is cognitive fusion, which is defined as the dominance of verbal rules over other sources of behavioral regulation. Both of these processes can have negative augmental functions in which harmless outcomes (e.g., “negative” emotions or sensations; verbally conceptualized outcomes of other kinds) acquire unwanted consequential control over behavior.

The goal of ACT is to construct an alternative social/verbal context in which behavior, in alignment with one’s values and goals, is more likely to occur even in the presence of difficult thoughts, feelings, or other private events (Hayes, S., 2004). Experiential avoidance is addressed by training in emotional openness or “acceptance,” while cognitive fusion is addressed by defusion methods. These can be described using the situation examined in the current study: the difficult sensations and thoughts that emerge as a runner engages in an extended forearm plank as part of athletic training and that normally lead to task termination.

Acceptance refers to the willingness to experience “private events occasioned by one’s history without unnecessary attempts to change their frequency or form, especially when doing so would cause psychological harm. [It] is fostered as a method of increased values-based action” (Hayes, S., 2004). In order to increase acceptance skills, participants are encouraged to experience discomfort without needless defense but

instead with an attitude of dispassionate curiosity. For runners, this may mean acknowledging the physical discomfort when they “hit the wall” and just noticing it while choosing to continue on with their race as opposed to succumbing to the distress and dropping out.

Cognitive defusion techniques attempt to alter the undesirable functions of thoughts by reducing their literal meaning and the “transformation of stimulus functions” they occasion as a result. In other words, ACT attempts to change the way one interacts with or relates to thoughts by creating contexts in which their unhelpful functions are diminished. For example, a runner might have the thought “this is too much! I have to stop!” in the absence of stimulation suggesting actual injury or other actual necessity to stop. A wide variety of defusion methods could undermine the literal meaning and believability of such a thought. For example, the runner might be asked to say the thought covertly in the voice of least-favored politician, or that of a cartoon character; to notice that “stop” spelled backwards is “pots” and then repeat “I have to pots;” to say the word “stop” rapidly and repeatedly for 30 seconds; to sing the thoughts; and so on. In so doing psychological flexibility suggests that the conceptualized reinforcing value of “stopping” can be temporarily diminished, resulting in greater task persistence.

These methods have been examined in task persistence in a number of different areas such as pain tolerance, conditioned fear, avoiding consumption of unhealthy food items, and so on (Levin, Hildebrant, Lillis, & Hayes, 2012). In comparison with other strategies for dealing with difficult emotions and thoughts, acceptance and defusion

have a particularly strong impact on task persistence, even though actual pain or negative affect are typically not reduced (Kohl, Rief, & Glombiewski, 2012).

An example of an application of willingness applied to task persistence in athletes is provided by Leeming (2016) in an unpublished dissertation that systematically examined mental toughness by evaluating the effects of verbal statements on the duration of a static weight hold by competitive cross-fit athletes. Leeming defined mental toughness as “psychological actions that achieve long-term goals (hardiness) while addressing immediate and pressing behavioral contingencies (grit)” (Leeming, 2016). Participants were asked to hold 1.5-2% of their body weight at a 90-degree angle to their body for as long as they could possibly endure. A within subject, alternating treatment design was used for this study. Four conditions were examined – baseline (only the first session), association cues: statements regarding the sensation and form of a proper static hold, dissociation cues: distraction from the sensation of a static hold, and cues focused on the willingness of the participant to experience the sensations of a static hold without abandoning task persistence. Each session consisted of four rounds, within one condition, with a one-minute rest period between each static hold. In the first experiment of this study, all six of the participants demonstrated a high degree of variability that made it impossible to adequately examine consistent differences or patterns between conditions. Strong fatigue patterns also occurred within and across sessions for all participants.

Differences were examined in a second experiment involving 45 participants in a pre/post group design on the same four conditions. In this experiment, logarithmic

transformations were applied to the group data. The association cues resulted in the time to exhaustion dropping in the last three rounds. The dissociation cues showed that time to exhaustion decreased on all rounds. The willingness cue, however, yielded an increase in the time to exhaustion. This study suggested that acknowledging the physiological sensations and deciding if one is willing to continue through the aversive condition is a helpful strategy in task persistence for athletes.

While a randomized trial is helpful, the failure to detect the same effect using a within subjects' design is somewhat worrisome. Athletes commonly try out various methods and not all athletes may respond in the same way. For these reasons and others, it is easier to prioritize methods that produce consistently superior within person effects.

In the Leeming study there were several variables that might have made within person analyses difficult. An important one is that the task itself was unfamiliar to participants and it is rarely included in athletic training. Initial adjustment to that unfamiliarity might have induced unwanted variation and thus made it more difficult to detect within person the same kinds of differences that were seen in the between person randomized trial. The use of a task that is more commonly part of training might have been both more realistic and more reliable as a source of information.

Leeming also studied only highly competitive Cross-fit athletes. Only very small differences can be expected for any particular intervention relating to their training when applied to elite athletes. Studying participants across a wider range of fitness

might have allowed for a more broadly useful examination of the differences, if any, that may exist between these conditions.

Finally, the examination of psychological flexibility methods was fairly limited in scope and focus. Only acceptance was studied, not defusion, and the willingness instructions used focused only on the willingness to continue, not on the willingness to experience difficult sensations while continuing. By including a wide range of methods and focusing them more precisely on the psychological flexibility model, within person differences might be made more likely.

In the present study all of these issues were addressed. This study examined how a broader range of flexibility interventions in a more fitness-diverse group of runners impacted persistence in a commonly used exercise designed to increase core strength.

Runners were chosen for this experiment because they spend a substantial amount of their time training and competing by themselves. Typically, a coach will provide their runner with various workouts to be completed largely on their own time. Unless it is a track workout, many running coaches do not accompany their runners in training. Given that situation, a runner is forced to find ways to manage their own private verbal behavior while running. Most runners have experienced situations in which their own thoughts became a barrier to top performance, and for that reason working on this issue has high ecological validity for this population. In the present experiment, defusion and acceptance based interventions were compared, within person, to a baseline condition, based on the length of a forearm plank hold in runners of varying levels of fitness.

Method

The current study utilized a within-subject, alternating treatment design (ATD) to examine the effects of verbal instructions, that orient towards willingness and defusion, that focus on covert verbal behavior thought to impact task persistence by athletes. All nine participants were runners and were obtained by word of mouth.

Inclusion Criteria. Individuals who were selected to participate in the study were over 18 years of age and were active runners. Runners were screened based on self-reports on how many miles they ran per week and their stated interest in increasing mental fortitude and performance outcomes. Participants were also selected based on their availability to meet for scheduled sessions over a two-week period.

Exclusion Criteria. Individuals that did not meet the above-mentioned criteria were excluded. Individuals were also excluded if they reported any recent shoulder or arm injuries that would prevent them from holding a forearm plank.

Demographic Data. During screening all participants provided demographic information regarding their age, gender, ethnicity, weight, athletic history, injury history, and current perceived level of fitness. They also answered questions regarding the types of training programs (i.e., Nike Run App, Hanson Marathon Method, Galloway Method, etc.) that they used and how often they used said training programs.

Setting

Due to the Coronavirus Pandemic, all experimental sessions were completed over Zoom. Participants were emailed a link to a Zoom virtual meeting room with a password for entry where they met with the lead investigator. Participants chose a

room in their home, placed a yoga mat on the floor, and instructions were provided by the researcher. All participants removed their socks prior to their first plank hold. The researcher's camera was turned off during the plank hold itself so that no gestural or facial feedback could be given to the participant as they held their planks. Except to provide scripted prompts or instructions, the researcher's microphone was also turned off. At the end of the participant's third plank, the Zoom call was ended.

Participants either met with the primary investigator Monday through Friday, took the weekend off, and then met Monday through Thursday of the second week, or they met Tuesday through Friday of the first week, took the weekend off, and then met Monday through Friday of the second week. Sessions were spaced 20-30 hours after the previous session. All sessions were video recorded through Zoom's recording feature, so that interobserver agreement could be collected.

Procedure

Forearm Plank Hold. The forearm plank hold protocol was selected due to its ability to simulate aversive conditions that would require mental toughness such as physical discomfort and fatigue. Plank holds are an exercise that can be engaged in without any equipment, which was needed with participants conducting sessions in their own home. It is also a training exercise with more limited potential impact of confounding variables that are commonly found in competitive exercises, such as body type, technique, time feedback, or audience effects.

Once the script for that day's experimental session was read, participants were instructed to begin their first plank hold of the session. All participants held the weight

of their body with their forearms parallel to the ground, their elbows at a 90-degree angle, their torso and legs fully extended and their tiptoes touching the floor. The investigator started the timer for plank hold duration once the participant's knees lifted from the floor and stopped the timer when at least one of the participant's knees touched the floor or when participant indicated they were unwilling to continue. Between each round, participants were given a three-minute rest period.

At the beginning of the first experimental session, it was explained to participants that the camera view of the researcher would be turned off throughout the sessions. They were also told that they would not have access to a clock nor would they be given information regarding how long their plank was lasting. If participants did have a watch on, they were asked to either take it off and place it somewhere that they would not be able to see it, or to flip it around on their wrist so that they could not view the face of the watch. All participants were told that they would receive their data at the end of the study and that the researcher would not be able to provide any feedback regarding the duration of their plank hold during the experiment per se. They were also all made aware that they could end the round at any time. Each session continued until three plank holds were completed using the approach assigned for that session. At the end of the session, participants were prompted to complete the Sports and Competition Monitor (Appendix I).

Experimental Conditions. Three experimental conditions were employed during the plank hold sessions. During baseline sessions, the researcher read the participant

the baseline condition script (see Appendix B for exact wording of the script) and instructed the participant to, “hold your plank for as long as you can.”

During acceptance sessions, or what we will call here the “willingness condition” since that term more closely matches the exact words used in the condition instruction, the researcher read the participant the condition script (Appendix C) and asked the participant, “Are you willing to continue while experiencing what shows up?” on a variable time (VT) schedule of 25 seconds. The lead investigator wrote out the times to prompt the participant, prior to the start of each session, for each of the three plank holds. Participants responded with either a verbal or gestural response. Other than the verbal question, the researcher muted their microphone while the participant held their plank.

The VT schedule itself was generated by randomly selecting an initial prompt between 10 and 25 seconds after the participant began their plank. The deliberately shorter average first interval was used to ensure contact with at least one prompt. Sequential prompts ranged between 15-35 seconds thereafter, with a mean of 25 seconds and a standard deviation of 5 seconds. If participants indicated that they were unwilling to continue, that ended the round.

During defusion sessions, the researcher read the participant the condition script (Appendix D), and instructed the participant to, “sing the thoughts you are having to the tune of a song.” The researcher then provided the participant a couple of minutes to choose a song and asked the participant to silently sing the experiences that showed up to the tune of the song they had selected. For example, if the person had picked “Happy

Birthday” as the song, and the thought “this really hurts” appeared, they would covertly sing something like the stanza “This really, really, really hurts; This really, really, really hurts; This really, really, really, really, really.... This really, really, really hurts.” When participants indicated they had chosen a song, the first plank hold commenced.

There were nine sessions in total for each participant. Each of the three conditions were conducted during three sessions each. The same experimental condition was not conducted more than two times consecutively. All participants began the study with a baseline condition. Conditions were then randomized using Random UX, a widely available smartphone app random number generator.

Dependent Measures. Duration data was the primary dependent measure for this study. Participant responses on the pre- and post- questionnaires, as well as their responses on the Sports and Competition Monitor, were also evaluated.

Instruments and Apparatuses

Questionnaires. Questionnaires were utilized for this study to acquire self-reports from participants regarding their values around mental fortitude, how they perceive their current mental toughness, how they perceived the experience, and to collect demographic information. Due to the Coronavirus Pandemic, all questionnaires were accessed through emailed links to Google Forms.

Committed Actions Questionnaire (CAQ). The CAQ consists of 18 statements that the participant rates on a 6-point Likert scale (McCracken, 2013; See Appendix E). This questionnaire was used to assess participant’s committed actions, a component of psychological flexibility, and to evaluate the propensity of the participant’s willingness

to persist in their goal-directed behaviors. It was completed before the participant began the study (See Appendix F for participant scores).

Sport and Competition Questionnaire-Pre and -Post (Revised). The Sport and Competition Questionnaire (SCQ) was designed by Leeming (2016) to be used in a study very similar to the present one and was used before the experiment began to describe the sample. It collects relevant demographic information, athletic history, and self-reports regarding participants athletic aptitude, perceived understanding of successful competition approaches, their views on the value of the mental aspects of competitions, and self-generated rules regarding mental toughness.

The SCQ was administered at the beginning and the end of the experimental study. The -Post questionnaire was similar to the -Pre questionnaire except that demographic questions were removed and social validity questions regarding the study interventions and protocols added (See Appendices G and J for pre and post versions of the SCQ; See Appendices H and K for participant responses to the pre and post versions of the SCQ). Minor modifications in the SCQ were made to fit the participants in the present study as contrasted to the Cross-Fit participants used in the original study.

Sport and Competition Monitor (Revised). The Sports and Competition Monitor (SCM) was used after each session. It was also developed by Leeming (2016) and asks for a rating of pain during the session, and open-ended questions about the strategies deployed and their perceived usefulness (See Appendix I). It was used to check on the difficulty of the task and to assess the social validity of the interventions in a preliminary

way. It was also used to check on possible iatrogenic effects of the intervention for ethical reasons but no such problems occurred.

Timer. A CDN TM 30 Direct Entry 2-Alarm Timer was used to track participant's plank duration to the nearest second. Research observers started and stopped the timer and the duration was recorded by the observer on the participant's data sheet. All sessions were recorded for inter-observer agreement purposes.

Data Collection and Integrity. To ensure condition instructions were presented consistently, a research assistant was trained on the session protocols and procedures for each condition as well as when the plank hold started and ended. The research assistant then reviewed and scored a randomly selected group of 30% of the videos. The variables assessed for accuracy and procedural integrity were the start and stop times of the plank holds, that the correct script was read at the beginning of each session, that the verbal statement in the willingness phase was presented on a VT schedule of 25 seconds, and that a three-minute rest period was given. Inter-observer agreement (IOA) was 100% in all categories.

Results

Characterizing the Sample

Participants were split into three classes of runners – Beginner, Amateur, and Ultra – and three participants were recruited in each category. Beginners were those who ran less than 15 miles per week and had no competitive racing experience; Amateurs ran 15-25 miles per week and had competed in a 5k-marathon race in the past year; Ultra runners ran more than 30 miles per week and had competed in a race of

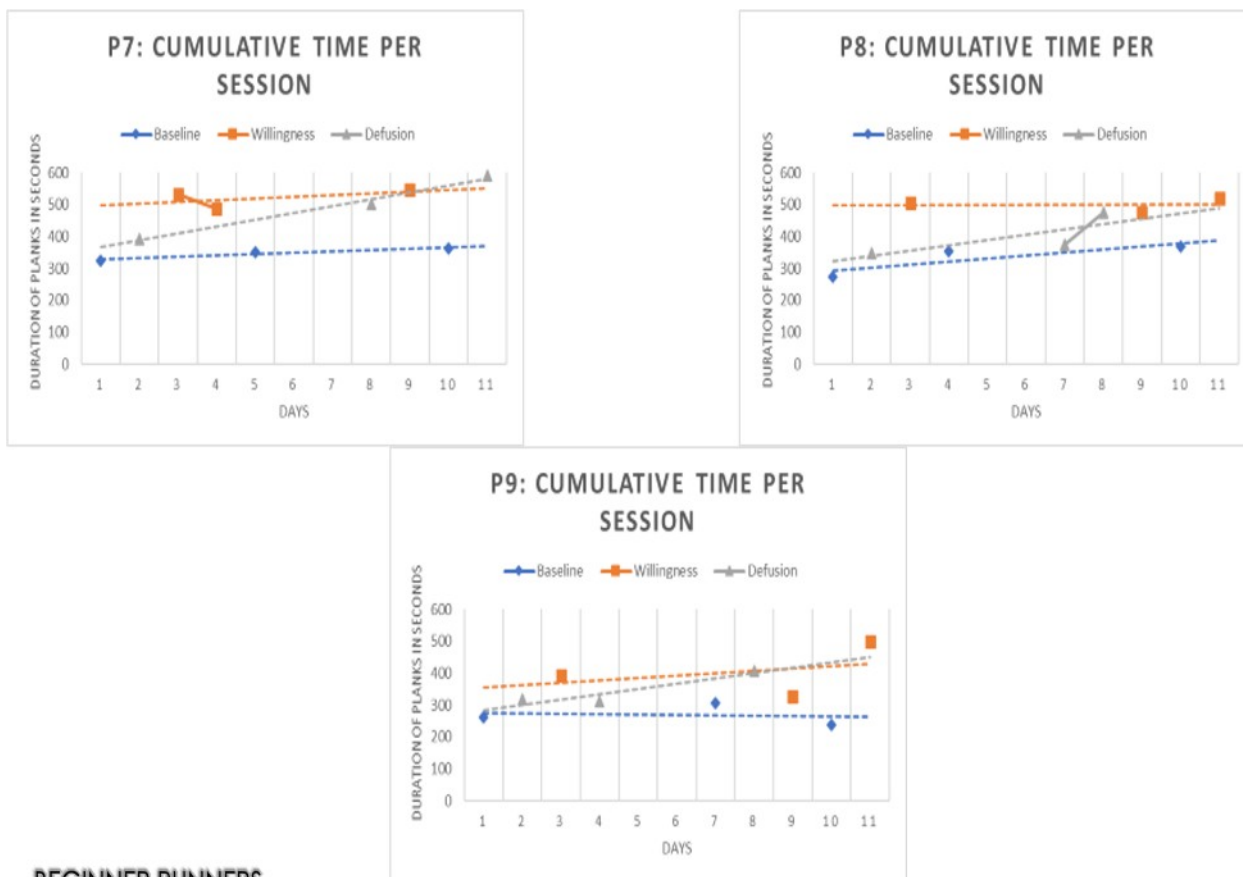
50 miles or more in the past year. A total of 4 males and 5 females were recruited, ranging in age from 28-69 years old with a mean age of 44.

Examining the Experimental Preparation

The plank hold task was meant to be challenging and post session SCM data suggested that it was.

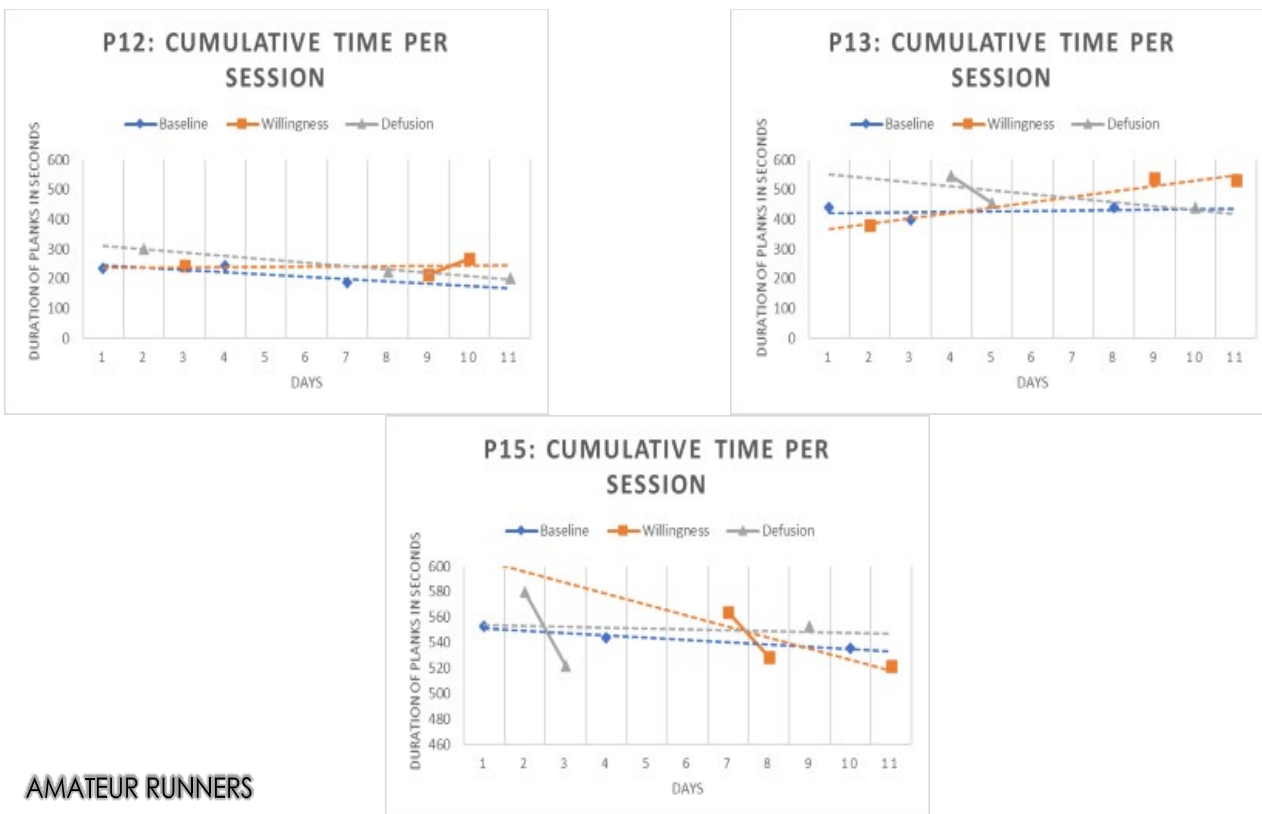
Visual Within Participant Outcome Analysis

The primary data of interest is the time to exhaustion in each session in each condition. These were first examined visually in an ATD fashion, participant by participant, using the cumulative time per session. These results are shown in Figures 1 through 3 below. Overall, these results can be characterized as follows.



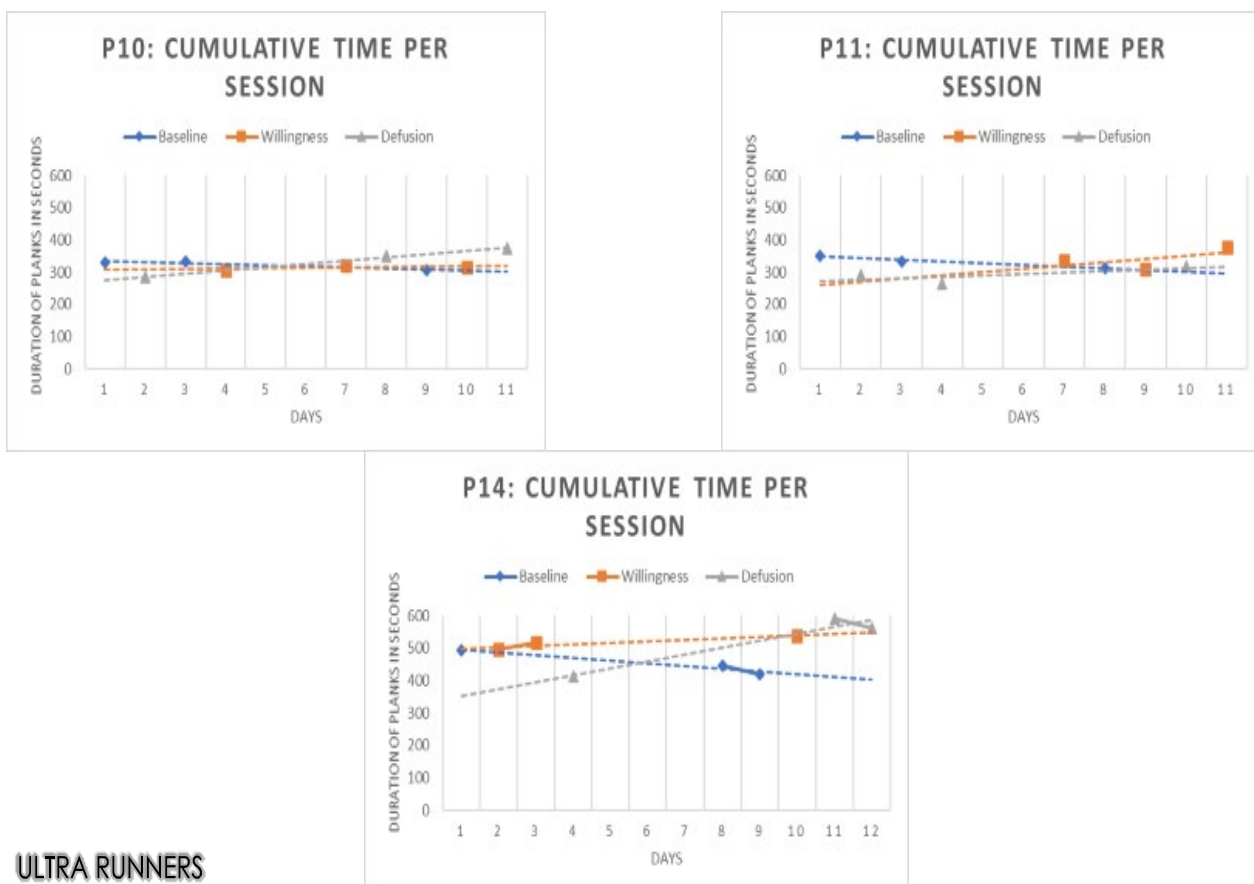
BEGINNER RUNNERS

Figure 1. Individual, Cumulative Plank Durations per Session



AMATEUR RUNNERS

Figure 2. Individual, Cumulative Plank Durations per Session



ULTRA RUNNERS

Figure 3. Individual, Cumulative Plank Durations per Session

To begin with the overall pattern observed, for the three Beginner Runners (P7, 8, and 9) baseline holds were lower with no overlap as compared to holds during either the willingness or defusion conditions and willingness appears to have yielded longer holds than defusion. The same general pattern occurred for Amateur Runners, and for P14 in the Ultra Runners, but with some minor overlap. Participants 10 and 11 in the Ultra Runners had extensive overlap of all conditions.

When the data are examined directly person by person it appears that the Beginner Runner group had the greatest change from baseline condition to both intervention conditions. The cumulative plank hold increases for P7 from baseline to the willingness condition was 151% and from baseline to the defusion condition was 143% increase. For P8, baseline to willingness increased by 151% and baseline to defusion increased by 120%. For P9, baseline to willingness increased by 151% and baseline to defusion increased by 129%

In the Amateur Runner group, the change from baseline to either intervention condition narrowed. The cumulative plank hold increase for P12 from baseline to willingness was 108% and from baseline to defusion the cumulative plank hold increased 109%. For P13, baseline to willingness increased by 114% and baseline to defusion increased 113%. For P15, the willingness phase actually decreased to 98% of the baseline condition. This particular participant stated that continuously being asked the same question in the willingness condition was aversive and they chose to end their planks, even though they could have continued, to avoid having to hear the question repeated. Participant 15 did have a slight increase from baseline to defusion by 101%.

The Ultra Runner group appeared to show the smallest change from baseline to intervention conditions. Two of these participants only had a visible increase in one intervention condition and not the other. For P10, there was a slight decrease in the cumulative plank hold duration in the willingness condition of 97% of the baseline condition. Participant 10 did have an increase of 104% in the defusion condition from the baseline condition. For P11, baseline to willingness increased by 103% and their defusion condition plank hold decreased to 88% of baseline. For P14, baseline to willingness increased 179% and baseline to defusion increased 181%.

These same time to exhaustion data are shown for all nine runners in Figure 4, organized by the ordinal position of each condition session and presented as session averages per hold. As can be seen more clearly in this collective presentation of the data, the baseline sessions yielded average holds of about two minutes, and show no trend over sessions, while both defusion and willingness sessions produce notably longer holds – increasingly so across sessions.

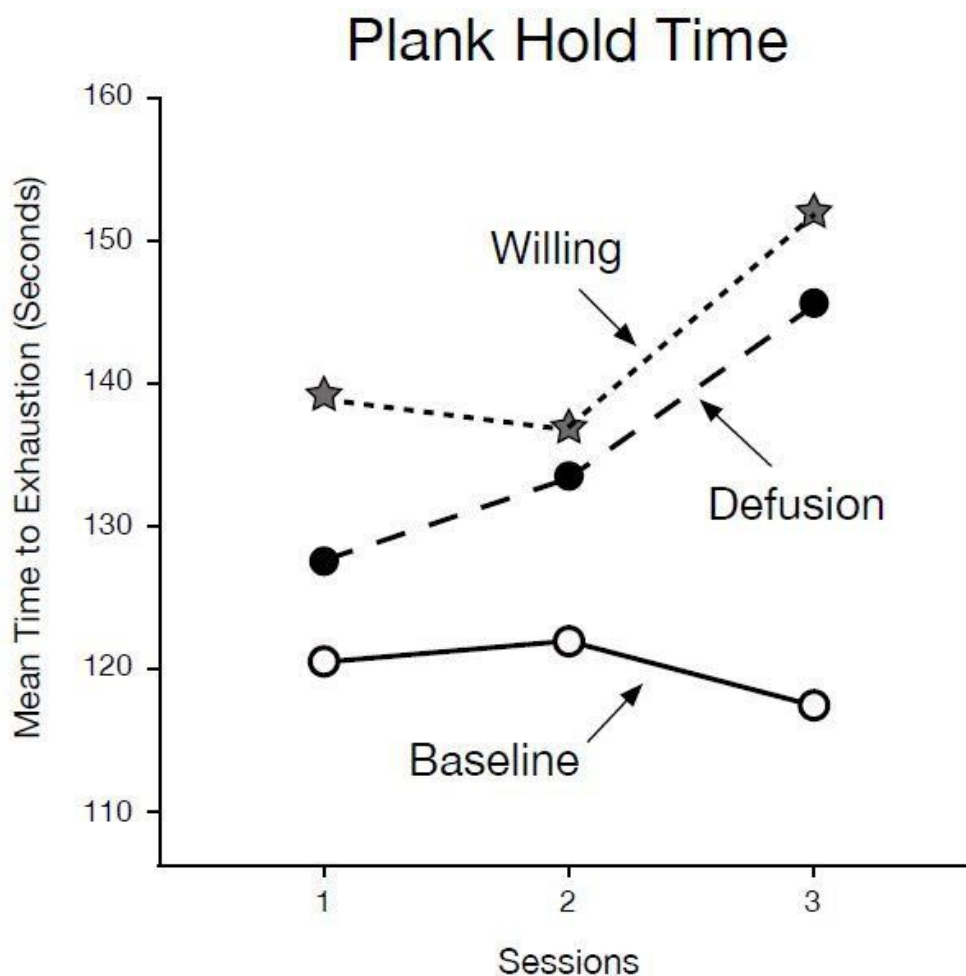


Figure 4. Average time to exhaustion across holds for each session in each condition
Inferential Statistical Outcome Analysis

The average time to exhaustion data shown in Figure 4 were subjected to a within subjects repeated measures analysis of variance using a three (sessions) by three (instruction condition) design. This analytic approach nests the results for the three repeated measures within each of the three within subject instructional conditions -- baseline, defusion, and willingness. A mixed model repeated measures was not used

because the data set was complete and a classical repeated measures approach is appropriate in the absence of any missing data (Krueger & Tian, 2004).

Mauchly's W was not significant for condition ($(2) = .557, p = .13$) or sessions ($(2) = .754, p = .37$) but it was for their interaction ($(9) = .066, p = .048$) so the degrees of freedom were adjusted using a Greenhouse-Geiser correction. Results showed a statistically significant effect for condition ($F(2,16) = 6.54, p = .008$; partial eta sq = .45, a large effect size), but not session ($F(2,16) = 2.97, p = .08$; partial eta sq = .27), nor their interaction ($F(2.22,17.72) = 1.42, p = .27$; partial eta sq = .15). Stated verbally, there was a small but non-significant improvement across sessions in each of the experimental conditions and fairly consistent performance in the baseline sessions. Differences between conditions, however, were fairly stable across sessions, at least in this small sample.

Because only condition differences were significant, the key focus of comparison is the mean time to exhaustion across planks in each condition. These means are shown in Table 1.

Table 1: Mean Time to Exhaustion for All Planks by Condition				
Condition	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Baseline	120.272	10.901	95.133	145.410
Willingness	143.062	11.952	115.500	170.624
Defusion	135.840	12.228	107.641	164.038

Pairwise comparisons between conditions showed that the willingness condition produced significantly longer plank holding as compared to baseline (Mean difference =

-22.79, SE = 8.22, $p = .024$, CI: -41.74 to -3.84), as did defusion compared to baseline (Mean difference = -15.57, SE = 6.04, $p = .033$, CI: -29.48 to -1.66). Willingness and defusion did not differ significantly (Mean difference = -7.22, SE = 4.53, $p = .15$, CI: -17.67 to 3.22).

A similar analysis was conducted using only the first trial in each session, and also using trial by trial data within each session. In all cases a similar pattern of results was found: there were significant effects for condition but no interactions with sessions or trials. Given that fact, those more complex analyses are not presented here.

Likewise, a set of repeated measures analyses of covariance were performed using age, gender, body weight, SCQ prescores, CAQ prescores, and number of miles run per week as covariates; and a similar set of one-way analyses of variance on the average session hold time by condition using these covariates. The same pattern of results was obtained in all instances. Given that fact, those analyses are likewise not presented.

Social Validity and Credibility of the Interventions

At the end of the study, the SCQ asked participants the following questions:

- Has this study changed how you approach your workouts?
- Has this study helped to improve your performance?
- Would you recommend this study to others?

All but one participant responded positively to all of these questions. Raw but anonymized results for the post intervention self-reports are shown in Appendix K. For 67% of the participants the longest plank hold occurred during the willingness condition.

It should be noted that those same participants stated in the SCM questionnaire that the VT question intervals provided some feedback and that they tried to hold their plank until the next prompt. This condition may be more closely related to a coaching situation where feedback is provided. No other patterns could be gleaned from the SCQ or SCM post measures.

The longest plank hold, for 33% of the participants, was in the defusion condition. Participants stated that they liked learning about a new strategy. In the SCM questionnaire, 67% of the participants stated that it was helpful in not focusing attention on their discomfort. No other patterns could be gleaned from the SCQ or SCM post measures.

Discussion

Covert verbal behavior is commonly said to be an important aspect of athletic performance. One major way to modify this behavior is through rules and instructions. In the present case the intent of the verbal guidance presented was to alter the aversive properties of the sensory consequences of a challenging athletic task. Cast in that way, the present study examines the use of verbal instructions as an attempt to further study “motivative augmentals” – verbal rules that temporarily alter the functional impact of behavioral consequences.

Research on motivative augmentals and how they can help increase an athlete’s performance can provide helpful training techniques for competitive athletes. ACT provides such skills training and a variety of studies have examined their impact in a non-athletic context (Levin et al., 2012). Research on the use of acceptance, defusion, and present moment awareness is needed to find productive ways to use these types of motivative

augmentals to sustain an athlete's highest level of performance during competition and training.

The present study provides some insight into the effects of utilizing acceptance and defusion for athletes at various levels of competition to increase their psychological flexibility under an aversive condition. Results from the present study validate Leeming's (2016) finding that willingness (acceptance) statements appear to function as motivative augmentals for the persistence of competitive athletes facing aversive conditions but it extended that research by examining defusion as well and doing so across a broader range of athletic fitness in a more naturally occurring training task. Unlike the Leeming study, these effects were documented within participant, which underlines the possible training relevance of these methods.

Both Leeming (2016) and the present study show that the willingness condition has strong effects, across participant athletic ability, over baseline. The willingness condition in both studies had a coaching element to it in that participants were prompted, frequently, to choose to continue. In the present study, participants were also asked whether they were willing to experience what came up as they persisted.

There may be an audience effect to this condition that is increased by the intervention. An athlete could continue to persist in the task due to someone watching and listening as they are asked to state their willingness to continue and to experience what comes up. This may be a helpful technique under training conditions but in competition, this may create issues. An athlete generally does not have their coach providing them feedback throughout individual competition or providing individual feedback when in

group competitions. In training, however, this could be very helpful in pushing an athlete just past their current comfort level and help shape up their strength or endurance. In the present study, 67% of the participants made statements about continuing with their plank until the next prompt was given. This suggests that the question on a VT 25s schedule could have provided some degree de facto temporal feedback. It would be worth testing an acceptance condition in which the participant engages in willingness phrases covertly in order to control for these variables and to see if it is as effective as the overt conditions used in these two studies.

This alternative account could also be examined by assessing the effects of timing feedback alone on another group of runners. Similarly, neutral verbal prompts could be added to both the baseline and defusion conditions (e.g., “how are you doing?”) so as to investigate whether time feedback implicit in the acceptance condition might have been responsible for increases in the plank hold duration.

It should be noted that this general issue was avoided in both the defusion and baseline conditions. Implicit temporal feedback was absent in both conditions and for that reason the head-to-head comparison between these two in this study is relatively well controlled. Furthermore, the covert nature of the defusion condition (silently singing about what is showing up experientially to the tune of a song) and the lack of interaction between the participant and the lead investigator structured a kind of self-management intervention that fits competition settings. The defusion condition did demonstrate an increase in plank holds across all fitness levels of participants, with hold time increases in this condition over baseline for all but one of the nine participants. For

that single participant plank hold times during defusion was in line with their baseline plank holds.

Defusion is not a technique that many athletes have come into contact with. Because of that a greater increase in performance might be seen with more training opportunities using defusion – and there was some indication of that with improving times in most participants during this condition. Because this condition is much more closely related to competition settings, where an athlete does not have a coach checking in with them every few seconds to encourage them to continue with the task at hand, defusion may allow for the athlete to better manage their private events on their own. In principle, defusion should allow the athlete to alter the aversive functions of covert thoughts or feelings and continue on with completing their goal.

There are a plethora of defusion techniques that an athlete can practice. Singing about the negative emotions that are occurring for them may seem silly to some athletes but a myriad of other effective methods are available in ACT writings and studies (Levin et al., 2012) such as repeating a short statement regarding what is showing up for them, spelling a word that defines their discomfort forward and then backwards, pretending to sling shot statements that normally stop them onto a tree or lamppost that they pass, or coming up with their own defusion technique would be more beneficial for them. ACT sports practitioners will need to mold the techniques to best suite the individual and their task at hand.

Utilizing beginning runners as participants in this study really allowed for the training effects of each intervention condition to be seen. As the runners became more

experienced, that effect became much more fine grained (although not statistically so in this small sample). Such an effect is to be expected with elite athletes. Individuals at the top of their competitive circles are constantly approaching ceiling effects but even with these athletes at the peak of their performance, they are always still striving to push just a little bit further. The within participant nature of the present study suggests that these interventions may be able to help push athletes past their perceived ceiling. Training with the use of willingness and defusion may assist in shaving off the fractions of seconds that might make the difference between winning and losing. Longitudinal studies with elite athletes are especially needed to assess the effects of these interventions over the long term and within subject comparisons are important to better evaluate the functional relationships of these interventions amongst athletes and their performances.

It should be noted that there are still untested assumptions in the present study needed to view acceptance and defusion methods as motivative augmentals. The use of talk aloud procedures or other experimental refinements will be needed to fully understand how statements such as the ones tested in this experiment work. The outcomes results, however, stand on their own and especially in the defusion condition, without obvious possible confounding variables. Thus, as a practical matter, the findings from this study are worth pursuing.

Athletic performance is more than physical fitness training. The present study suggests that how an athlete responds to private experiences with covert verbal behavior during training and competition is also relevant. Just like one has to engage in exercises to build up their physical strength, one also has to put in the effort to build up their mental fortitude. Practicing willingness and defusion techniques may be able to

help build that mental toughness.

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APPENDIX

Appendix A

Thesis Consent Form

We are conducting a research study to learn about the effects of verbal behavior on an athlete's endurance to perform.

If you volunteer to be in this study, you will be asked to engage in a plank hold while being monitored via online conference call.

Your participation should take approximately 15 minutes per session and consist of 6 sessions. For a total commitment of one and a half hours.

This study is considered to be minimal risk of harm. This means the risks of your participation in the research are similar in type or intensity to what you encounter during your daily activities. You may experience muscle soreness.

Benefits of doing research are not definite; but we hope to learn how to increase performance persistence. There may be no direct benefits to you in this study activity.

The researchers and the University of Nevada, Reno will treat your identity and the information collected about you with professional standards of confidentiality and protect it to the extent allowed by law. You will not be personally identified in any reports or publications that may result from this study. The US Department of Health and Human Services, the University of Nevada, Reno Research Integrity Office, and the Institutional Review Board may look at your study records.

You may ask questions of the researcher at any time by emailing Steven C. Hayes at stevenchayes@gmail.com

Your participation in this study is completely voluntary. You may stop at any time. Declining to participate or stopping your participation will not have any negative effects on your health.

You may ask about your rights as a research participant. If you have questions, concerns, or complaints about this research, you may report them (anonymously if you so choose) by calling the University of Nevada, Reno Research Integrity Office at 775.327.2368.

Thank you for your participation in this study!

I have read and consent to participate in this study.

Signature of participant

Date

Appendix B

Baseline Phases

Script:

During this exercise you will be holding a plank for as long as you can. This exercise is to assess pain tolerance. It is not a measure of strength or technique. As a result, this task is not likely to produce any long-lasting effects or produce residual soreness that will impact later exercise performance. The pain is only momentary. However, the longer you continue to hold the plank, the more uncomfortable you will become. You will hold the plank position for three rounds, with a 3-minute rest periods between each round.

Appendix C

Willingness Phases:

Script:

We are studying mental toughness. During this exercise you will be holding a plank for as long as you can. This exercise is to assess pain tolerance. It is not a measure of strength or technique. As a result, this task is not likely to produce any long-lasting effects or produce residual soreness that will impact later exercise performance. The pain is only momentary. However, the longer you continue to hold the plank, the more uncomfortable you will become. You will hold the plank position for three rounds, with a 3-minute rest period between each round. While you are holding the plank, I will be asking you, "Are you willing to continue while experiencing what shows up?"

- On a VT 20s schedule participant will be asked, "Are you willing to continue while experiencing what shows up?"

Appendix D

Defusion Phases:

Script:

We are studying mental toughness. During this exercise you will be holding a plank for as long as you can. This exercise is to assess pain tolerance. It is not a measure of strength or technique. As a result, this task is not likely to produce any long-lasting effects or produce residual soreness that will impact later exercise performance. The pain is only momentary. However, the longer you continue to hold the plank, the more uncomfortable you will become. You will hold the plank position for three rounds, with a 3-minute rest period between each round. While you are holding the plank, there will be moments when your muscles will feel sore or you may feel like ending the round. When this occurs, sing the thoughts you are having to the tune of a song, repeat the song about what you feeling over and over.

Appendix E

Committed Action Questionnaire

0 Never True	1 Very Rarely True	2 Seldom True	3 Sometimes True	4 Often True	5 Almost Always True	6 Always True
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1	I am able to persist with a course of action after experiencing difficulties	0	1	2	3	4	5	6
2	When I fail in reaching a goal, I can change how I approach it	0	1	2	3	4	5	6
3	I can remain committed to my goals even when there are times that I fail to reach them	0	1	2	3	4	5	6
4	When a goal is difficult to reach, I am able to take small steps to reach it	0	1	2	3	4	5	6
5	I act impulsively when I feel under pressure	0	1	2	3	4	5	6
6	I prefer to change how I approach a goal rather than quit	0	1	2	3	4	5	6
7	I am able to follow my long terms plans including times when progress is slow	0	1	2	3	4	5	6
8	When I fail to achieve what I want to do, I make a point to never do that again	0	1	2	3	4	5	6
9	I get stuck doing the same thing over and over even if I am not successful	0	1	2	3	4	5	6
10	I find it difficult to carry on with an activity unless I experience that it is successful	0	1	2	3	4	5	6
11	I am more likely to be guided by what I feel than by my goals	0	1	2	3	4	5	6
12	I am able to pursue my goals both when this feels easy and when it feels difficult	0	1	2	3	4	5	6
13	I am able to persist in what I am doing or to change what I am doing depending on what helps me reach my goals	0	1	2	3	4	5	6
14	If I make a commitment and later fail to reach it, I then drop the commitment	0	1	2	3	4	5	6

15	I am able to incorporate discouraging experiences into the process of pursuing my long-term plans	0	1	2	3	4	5	6
16	If I feel distressed or discouraged, I let my commitments slide	0	1	2	3	4	5	6
17	I get so wrapped up in what I am thinking or feeling that I cannot do the things that matter to me	0	1	2	3	4	5	6
18	If I cannot do something my way, I will not do it at all	0	1	2	3	4	5	6

Appendix F**Committed Actions Questionnaire Participant Scores**

	CAQ Scores
Participant 7	67
Participant 8	65
Participant 9	61
Participant 10	58
Participant 11	52
Participant 12	58
Participant 13	72
Participant 14	68
Participapant 15	53

Appendix G

Sport and Competition Questionnaire (Pre) - Revised

Date: _____ Participant #: _____ (Research Team to complete)

Demographic Information:

Sex: M / F Age: _____ Ethnicity: _____ Approximate Weight: -

Do you currently have any injuries that you are recovering from? If yes, please explain:

How long have you been a runner? _____

How many times a week do you train / work out? _____

On average, how many miles do you run per week? _____

In the last year, have you competed in running races?

If yes, please list the races and the distance you competed in:

Race name: _____ Distance: _____

Race name: _____ Distance: _____

Race name: _____ Distance: _____

Race name: _____ Distance: _____

Race name: _____ Distance: _____

Race name: _____ Distance: _____

Do you have a history with other sports or athletic activities? If yes, please explain:

Running Questions:

		Never True	Rarely True	Often True	Always True
1.	I consider myself to be a mentally tough competitor.				
2.	I set goals to improve my performance.				
3.	I follow a training program to meet my goals.				
4.	I value mental toughness.				
5.	I believe I am capable of performing better than I usually do.				
6.	I get distracted when I think about how I feel during competitions.				
7.	I get discouraged if I don't meet my goals.				
8.	I must control my emotions in order to be a successful competitor.				
9.	I meet, or satisfactorily approximate, the performance expectations I set for competitions.				

10. If you use a specific training program for competitions, what program do you follow?

11. How often do you incorporate a rest / recovery day into your training?

12. Do you compete or train for events other than running? If yes, please describe:

13. Explain what type of mental strategies you might use to increase your performance completion:

14. When a training exercise becomes painful, frustrating, or hard, do you try to control those thoughts and feelings by **focusing** on what you are doing? How helpful is this to you?

15. When competing in an event becomes painful, frustrating, or hard, do you try to control those thoughts and feelings by **focusing** on those events? How helpful is this to you?

16. When a training exercise becomes painful, frustrating, or hard, do you try to control those thoughts and feelings by **distracting** yourself from those events? How helpful is this to you?

17. When competing in an event becomes painful, frustrating, or hard, do you try to control those thoughts and feelings by **distracting** yourself from those events? How helpful is this to you?

Appendix H

Sport and Competition Questionnaire (Pre) – Revised: Participant Responses

	Age	Sex	Ethnicity	Weight	Do you currently have any injuries that you are recovering from? If yes, please explain	How long have you been a runner?	How many times a week do you train / work out?	On average, how many miles do you run per week?	In the last year have you competed in running races? If yes, please list the races and the distance that you competed in.	Do you have a history with other sports or athletic activities? If yes, please explain.	I consider myself to be a mentally tough competitor.
Beginner	34	Female	Latina	120	No	Off and on for about 20 years	3-5 days	10-15 miles	No	Basketball, volleyball, track	Neutral
Beginner	28	Female	Caucasian	150	None	5 years	3-4 times	10-12	No	NCAA D 1 Swimming (2011-2015), USA Triathlon (2015-current), Archery (2017-current)	Neutral
Beginner	35	Male	Caucasian	175	No	3 years	2-4	4	None	Climbing, Ice Hockey	Neutral
Amateur	55	Female	Caucasian	107	No	35 years	Daily	15	Last running race was Berlin Marathon 9/19	Yes, cycling, weight training, skiing, water sports, anything outside	Often true
Amateur	69	Female	White	98	No	40+ years	7	15	None. Signed up for several which were all cancelled.	Biking Swimming Pilates Triathlons Spinning	Always true
Amateur	55	Male	Reno	200	None at this time.	15 yrs	7 days a week	25	None do to covid	Yes biking and cross fit.	Always true
Ultra	46	Male	Latino	170	Plantar fasciitis, turf toe, ulnar collateral ligament issues, hyperextension of left ring finger	9+ years	6-7 times	45-60 miles	Two 100 milers, one 100k, two 50k, two 30k, two 23 milers, and various 10 mile and 10k trail races	College baseball	Always true
Ultra	33	Female	white	139	no	six years	7-Jun	about 30	Wild Winter Round Up 5k Foresthill Divide Loop 30k Fresh Track 5k Snowshoe Race Ruck A Chuck 50k Escape from Prison Hill 1/2 Marathon Silver State 50k Tahoe Rim Trail 50 miler Bizz Johnson 1/2 marathon Running With Rudolf 10k Dead Truck 35k Fresh Track 5k Snowshoe Race Black Canyon 60k March Mudness 5k	I played baseball, volleyball, basketball and ran track in elementary/middle school. I was in cheer in high school. I have also snowboarded for most of my life.	Often true
Ultra	45	Male	White	141	No	11 years	6	25-35	Fools Traverse 27 miles, Evolution valley 40 miles	Rock climbing, cycling, mountain bike riding	Always true

I set goals to improve my performance.	I follow a training program to meet my goals.	I value mental toughness.	I believe I am capable of performing better than I usually do.	I get distracted when I think about how I feel during competitions.	I get discouraged if I don't meet my goals.	I must control my emotions in order to be a successful competitor.	I meet, or satisfactorily approximate, the performance expectations I set for competitions.	If you use a specific training program for competitions, what program do you use?	How often do you incorporate a rest / recovery day into your training?	Do you compete or train for events other than running? If yes, please describe.
Often true	Neutral	Often true	Often true	Neutral	Neutral	Rarely true	Neutral	None	1-2 days per week	No
Often true	Neutral	Often true	Always true	Neutral	Often true	Rarely true	Often true	Samsung S Health app on watch and phone	Always	triathlon, biathlon, archery
Often true	Often true	Often true	Neutral	Neutral	Neutral	Neutral	Neutral	None	Once or twice per week	None
Often true	Always true	Often true	Neutral	Rarely true	Often true	Often true	Often true	I have a specific running program for marathon training	Weekly	No
Always true	Often true	Always true	Often true	Rarely true	Rarely true	Never true	Often true	None. I set my own training program.	Usually take off only 1 day	Yearly Triathlon and Biking events
Always true	Often true	Always true	Always true	Rarely true	Often true	Often true	Often true	I have a trainer that makes up my schedule	One day a week.	No
Always true	Always true	Always true	Always true	Rarely true	Rarely true	Rarely true	Often true	I use one I've developed for myself	Usually one day per week	No
Always true	Often true	Always true	Often true	Rarely true	Neutral	Often true	Often true	I make my own training plan based on when I have a race and also around my menstrual cycle. The general idea is during my low hormone phase I do more high intensity/longer workout and during my high hormone phase I keep is more moderate to low in intensity and duration.	1-2 days/week	No.
Always true	Often true	Always true	Always true	Neutral	Rarely true	Often true	Often true	Nothing formalized	Twice a week but still active with cross training	Cycling

Explain what type of mental strategies you might use to increase your performance completion.	When a training exercise becomes painful, frustrating, or hard, do you try to control those thoughts and feelings by focusing on what you are doing? How helpful is this to you?	When competing in an event becomes painful, frustrating, or hard, do you try to control those thoughts and feelings by focusing on those events? How helpful is this to you?	When a training exercise becomes painful, frustrating, or hard, do you try to control those thoughts and feelings by distracting yourself from those events? How helpful is this to you?	When competing in an event becomes painful, frustrating, or hard, do you try to control those thoughts and feelings by distracting yourself from those events? How helpful is this to you?
Focusing on my breathing, trying to implement what I know about best strategies	Yeah probably, usually helps	Haven't competed since high school-can't quite remember what I did.	Sometimes I try to focus on my music or the scenery around me. Seems to help some.	NA-haven't competed in a while
Focus on cadence, count strokes, say my "why are you doing this" statement in my head (ex. in college it was "this is to make the conference team"), look for the next person to pass and then try to catch them.	Yes. Success depends on the muscle group in distress. For example, when my quads go, I'm usually toast, but if my abs are sore I can typically redirect to stay on task with success.	Yes, I look for the next person to pass and focus on closing the distance. It's successful until there is no one in sight in front of me or has the opposite effect if I can't manage to close the distance.	Sometimes I do try and sometimes I just give in and stop.	Not usually. I like to win more than I dislike pain (within reason ha). I like to focus on the painful muscle and think of maintaining consistent movement rather than trying to avoid thinking about it.
None	Sometimes and kinda	No	Sometimes and kinda	Yes and sometimes
Breathing, chanting, song in my head	I try to distract myself	I think about the finish line	Yes, and it is helpful	Yes, and it is helpful to me
Visualization Positive thinking	Very helpful. I go easy on myself. "That today may not be my best performance but I will do the best I can".	Very helpful. I stay focused and push through and think only positive thoughts.	I usually just stay focused. Just ease up on pushing myself so hard.	I stay focused and think only positive thoughts. That I'm doing the best that I can.
Picture the complete race in my head.	Yes I try to think about the feelings I am having. And come up with why I feel this way.	I suppress all these and stay focused. This is very helpful.	I focus on overtaking the next competitor.	Not very, I focus on the competitors around me.
Diaphragmatic breathing, meditation, and listening to the body	I focus on the goal, focus on the pain/discomfort, and acknowledge all of it	Same as the last answer	Same	Same
When I hit a rough patch during a race/training run/workout, I try to channel the hardest times in my life and remind myself that if I got through that, I can get through this, that the pain is only temporary. I think about my partner (EJ) and how strong and inspiring he is as a runner because he always stays so positive, so I try to channel that. I also practice gratitude. I try to remember how grateful I am able to run and compete in races and that I have my health. I question why I am out there, I remind myself that I WANTED to do this race, that I paid money to do it and that it was my choice to run, no one else's so just shut up and get it done! :)	Yes, I try to focus on my form and breathing. It helps me feel more relaxed.	I focus on the race itself sometimes. It helps me get through the tough parts because it reminds me of why I wanted to run the race to begin with and what my end goal is.	Definitely. At times I find that distracting myself is more helpful than focusing on the training because it takes my mind off of the pain.	During a race, especially an ultra where you are out there for hours on end, I spend a lot of time distracting myself, whether it be checking out the scenery, talking to fellow runners, or sometimes listening to music. It helps me because it makes the time/miles just go by faster and takes my mind off of any pain/frustration.
I have no idea. No strategy. Just do it.	I think that's what's addicting about it. If it was easy it wouldn't be any fun.	It's more helpful to focus on finishing than to dwell on the event.	Yes. I do math and try to keep my mind busy	Yes. Most of my events are in the mountains so I try to distract myself with my surroundings

Appendix I

Sport and Competition Monitor (Administered after every session)

Date: _____ Participant # _____ (Research Team to complete)

Did you notice or encounter any unique or unusual events that may have impacted your performance in training since the last meeting? If yes, please describe:

Were there any times since the last meeting that you can remember feeling stressed, frustrated, or emotional during training? If yes, how many times?

Do you feel like this had an impact on your performance? If yes, was this impact positive or negative? _____

How painful was this session?

Not Extremely
painful painful

1	2	3	4	5	6	7	8
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Do you feel like the way you approach the mental aspects of training have changed since the last session? If yes, please describe:

Explain what you might do to increase your ability to hold your plank longer.

Do you think you beat your best time during this session? What makes you think that you did or did not accomplish this?

DEFUSION SESSION ONLY: What song did you choose to sing your experience to?

Appendix J

Sport and Competition Questionnaire (Post) – Revised

Date: _____ Participant #: _____ (Research Team to complete)

Demographic Information:

Approximate Weight: _____

Running Questions:

		Never True	Rarely True	Often True	Always True
1.	I consider myself to a mentally tough competitor.				
2.	I set goals to improve my performance.				
3.	I follow a training program to meet my goals.				
4.	I value mental toughness.				
5.	I believe I am capable of performing better than I usually do.				
6.	I get distracted when I think about how I feel during competitions.				
7.	I get discouraged if I don't meet my goals.				
8.	I must control my emotions in order to be a successful competitor.				
9.	I meet, or satisfactorily approximate, the performance expectations I set for competitions.				

10. Do you feel this study has changed how you approach workouts and competition from a mental standpoint? If yes, how so?

11. Did you find this study helpful to your competition performance and / or athletic training? If yes, how so?

12. In your last session, what did you do to maintain your plank when you wanted to end the round?

13. Would you recommend this study to others? If yes, why?

Appendix K

Sport and Competition Questionnaire (Pre) – Revised: Participant Responses

	Weight	I consider myself to be a mentally tough competitor.	I set goals to improve my performance.	I follow a training program to meet my goals.	I value mental toughness.	I believe I am capable of performing better than I usually do.
Beginner	150	Often true	Always true	Often true	Always true	Always true
Beginner	170	Neutral	Often true	Often true	Often true	Often true
Beginner	120	Neutral	Often true	Neutral	Often true	Always true
Amateur	107	Often true	Often true	Often true	Always true	Often true
Amateur	100	Often true	Always true	Often true	Always true	Often true
Amateur	200	Always true	Always true	Often true	Always true	Always true
Ultra	139	Often true	Often true	Often true	Always true	Always true
Ultra	169	Always true	Always true	Always true	Always true	Always true
Ultra	145	Often true	Often true	Often true	Often true	Often true

I get distracted when I think about how I feel during competitions.	I get discouraged if I don't meet my goals.	I must control my emotions in order to be a successful competitor.	I meet, or satisfactorily approximate, the performance expectations I set for competitions.	Do you feel this study has changed how you approach workouts and competition from a mental standpoint? If yes, how so?	Did you find this study helpful to your competition performance and / or athletic training? If yes, how so?	In your last session, what did you do to maintain your plank when you wanted to end the round?
Neutral	Often true	Rarely true	Neutral	Yes. Trying not to think about it or attempting to "clear my thoughts" was not effective (i.e. the baseline conditions)	Yes, I have some new strategies that I like and thought were helpful (the song especially).	Sang a funny song. My favorite one was "I'll make a man(some abs) outa you".
Neutral	Often true	Neutral	Often true	No	No	I sort of just absent-mindedly went to failure
Neutral	Neutral	Neutral	Often true	Yeah. I think I learned additional strategies to push my limits.	Yeah. It was worthwhile trying out new strategies and seeing how they impacted my behavior.	Gave myself a goal of continuing for so many intervals of Ashlie asking me whether I wanted to continue
Often true	Often true	Neutral	Often true	Yes because planks are hard so I needed to strategize	Yes, I got better at finding the zone	Slowly Counted to 10 repeatedly In different wsys
Rarely true	Often true	Often true	Often true	Yes. Pushing myself past the point of wanting to give up!	Yes. I have continued to do 3 minute planks daily. Great way to start my day. I have since learned how good planks are for overall fitness.	Kept telling myself "hang in there just a little longer."
Rarely true	Rarely true	Often true	Often true	Yes, I felt that the amount of time i was able to hold my planks should have been far longer.	Yes, it made me realise that I need to work on my core strength.	I was able to remove myself mentally from the exercise.
Often true	Often true	Often true	Often true	A little, yes. I think I found new methods that can help me push through the pain.	Yes. I found that planking everyday for the past two weeks has actually made a difference in my core strength, which has translated to my running. I want to continue to do planks everyday.	I focused on making my exhale as long as possible, it seems to ease the pain a bit.
Neutral	Neutral	Rarely true	Often true	It has given me more insight to the fact that I have more mental toughness in performing certain workouts and athletic activities over others. It was interesting to see.	Yes, it diversified my approach to mental toughness as it applies to things that aren't within my strong skill set.	I regulated and focused on my breath throughout. Basically, I engaged in breathing exercises to help with focus and achieving my goals of the exercise.
Neutral	Neutral	Often true	Often true	No	Yes. It reminded me to keep my mind busy and distracted from what I was experiencing physically	I did math problems