

## Leveraging Sports Psychology to Improve Team Performance Huddles

**Joanne Barnieu, M.S.,**  
**Steven Aude, Ph.D., Angela Ferreira, Ph.D., M.P.S.,**  
**Heidi-Keller Glaze, Ph.D., Kate Lambourne, Ph.D.,**  
**Ryan Riley, M.A., MaryAnn Stassen, M.S.**  
ICF Incorporated, LLC.  
Reston, VA  
[joanne.barnieu@icf.com](mailto:joanne.barnieu@icf.com),  
[steven.aude@icf.com](mailto:steven.aude@icf.com), [angela.ferreira@icf.com](mailto:angela.ferreira@icf.com),  
[heidi.keller-glaze@icf.com](mailto:heidi.keller-glaze@icf.com), [kate.lambourne@icf.com](mailto:kate.lambourne@icf.com),  
[ryan.riley@icf.com](mailto:ryan.riley@icf.com), [marvann.strassen@icf.com](mailto:marvann.strassen@icf.com)

**Nathanael Keiser, Ph.D.,**  
**Christopher Vowels, Ph.D.**  
U.S. Army Research Institute  
Fort Cavazos, TX  
[nathanael.l.keiser.civ@army.mil](mailto:nathanael.l.keiser.civ@army.mil),  
[christopher.l.vowels.civ@army.mil](mailto:christopher.l.vowels.civ@army.mil)

### ABSTRACT

As a form of interim or formative feedback, a sports timeout can provide effective instruction and lead to peak competitive performance (Andrews, 2015). A timeout is spontaneous and brief and can serve as an intervention to improve performance on the spot. Conversely, an after-action review (AAR), which is a summative feedback technique frequently used in the Army, is deliberate, comparatively lengthy, and after the fact. The U.S. Army Research Institute (ARI) is conducting research aimed at improving the assessment of hard to measure team constructs during live training and determining how to help instructors and trainees better understand the impact of those constructs on performance. Further, ARI is interested in feedback approaches that allow an instructor to effectively address these constructs. As such, the present research applies an interim feedback approach with small ad-hoc squads during a simulated tactical combat casualty care training exercise. This approach (termed the squad huddle) was designed to last approximately three minutes, led by an instructor during a transition from one set of tasks to another, similar to a sports timeout. The research team explored relevant sports psychology literature to identify characteristics of effective timeouts. Further, the team reviewed extant feedback literature to incorporate best practices in the huddle design that would allow the instructor to reduce ambiguity around goals and standard performance (Gregory & Levy, 2015), reduce cognitive load on the huddle participants (Sweller, 1988), balance positive and constructive feedback, and ensure psychological safety. The literature search resulted in a carefully designed squad huddle that was iteratively refined based on Army instructor feedback. An experiment was conducted to field test the efficacy of the huddle with favorable results. Data (mean score differences) indicate that such a feedback approach may benefit trainers, instructors, and educators as they seek to improve small unit or group performance.

### ABOUT THE AUTHORS

**Joanne Barnieu, M.S.** is a Senior Lead Learning Scientist at ICF, focusing on the design and execution of military training effectiveness research studies. Ms. Barnieu has 32 years of experience in adult learning and education and specializes in the experimentation of innovative training and assessment strategies based on relevant learning science literature. Research interests include natural language processing and the use of emerging training technologies. Ms. Barnieu is bilingual English/French and holds a B.A. in French Education with a minor in Business Administration from Franklin and Marshall College and an M.S. in Organizational Development from Saint Joseph's University.

**Steven Aude, Ph.D.** is a Senior Managing Director, Human Performance at ICF, focusing on individual, team, leader, and organizational performance applied research across the Department of Defense and federal sector. His research topics and interests include validating the psychological variables impacting small unit performance, conducting leadership assessment, feedback, and coaching; and identifying the enduring values, beliefs, and norms of military unit culture from a multi-disciplinary perspective. Dr. Aude previously served as a career Army officer holding positions of leadership in infantry and special forces units. He holds a PhD in measurement and evaluation and a Master's degree in organizational psychology from Teachers College, Columbia University.

**Angela Ferreira, Ph.D., M.P.S.** Dr. Ferreira's work has focused on advanced quantitative methodologies and experimental designs. Research interests include large scale data and report automation, employee behavior including satisfaction, loyalty and engagement and other workforce issues. Dr. Ferreira holds an M.A. in Experimental Psychology, a Ph.D. in Behavioral Science, and an M.P.S. in Industrial Organizational Psychology.

**Heidi Keller-Glaze, Ph.D.** is a Director of Human Capital with ICF and holds a Ph.D. in Industrial and Organizational Psychology. She has 21 years of experience working on training, assessment, and leadership projects for the Army, including in a project management role. As a project manager, she has developed research plans, collected qualitative and quantitative data in field and training settings, analyzed data and interpreted results, and presented findings and recommendations to senior leaders. Dr. Keller-Glaze has conducted focus groups and interviews with NCOs, officers, and Army civilians on a variety of topics, including unit culture, the dynamics of design teams, toxic leadership, leader development, and the Army education system.

**Kate Lambourne, Ph.D.** is a Lead Human Capital Consultant with ICF and has more than 13 years of experience in the research environment. At ICF, Dr. Lambourne is largely focused on the Army, with emphasis on leadership, cognitive assessment, and culture. She also has experience with longitudinal evaluations in the non-profit sector. Her skills include qualitative and quantitative research design and analysis, program evaluation, literature review, survey development, and product development (e.g., handbooks). In addition to her work at ICF, Dr. Lambourne has conducted research in exercise psychology and has published more than 30 articles in peer-reviewed, scholarly journals. She has also taught graduate-level courses in theories of motivation and undergraduate courses in health.

**Ryan Riley, M.A.** is a Director of Human Capital at ICF and has 17 years of experience conducting research in the Federal sector. Mr. Riley's primary focus is on organizational assessment and research on leadership, leader development, and human performance. His recent experiences include leading all phases of the Army's annual survey of leadership and leader development; evaluation of Army professional military education; and research, development, and evaluation of applied products to support Army leader and soldier performance. Mr. Riley holds an M.A. in Industrial-Organizational Psychology from Minnesota State University, Mankato. He completed 10 years of service in the U.S. Army National Guard.

**MaryAnn Strassen, M.S.** is a Senior Management Specialist at ICF and holds an M.S. in Industrial-Organizational Psychology from Missouri State University. Ms. Stassen has over 10 years of experience as a research professional and organizational consultant. Areas of research expertise include diversity, equity, and inclusion; organizational culture; and leadership development. Ms. Stassen applies her organizational expertise and research strengths to the study of organizational leadership, development of applied research products, and improvement of processes. Current efforts involve the study of the Army's leadership model and developing interventions for leader development to include survey development and administration, intervention development, data analysis, and quantitative writing.

**Nathanael Keiser, Ph.D.** is a research psychologist with the U.S. Army Research Institute's Fort Cavazos Research Unit. He received a Ph.D. in Industrial-Organizational Psychology from Texas A&M University in 2017. His research interests include team performance, organizational training, and safety. Prior to his current position, he spent a year as a postdoc at the Gaming Research Integration for Learning Laboratory, as a part of the Air Force Research Laboratory. He also spent time as an applied researcher at the Center for Innovations in Quality, Effectiveness and Safety, funded through the Baylor College of Medicine and Department of Veterans Affairs.

**Christopher Vowels, Ph.D.** is an applied experimental psychologist and is currently a team leader with the U.S. Army Research Institute (ARI) at Fort Cavazos, Texas. He has spent the past decade conducting research to improve unit performance measurement, particularly for live training environments. Vowels is a former Consortium Research Fellow at the ARI Fort Leavenworth Research Unit. He was a dual-major and received a B.A. degree in Biology and Psychology from Central Missouri State University followed by a Ph.D. in Psychology from Kansas State University, with an emphasis on cognition and judgment and decision-making.

## Leveraging Sports Psychology to Improve Team Performance Huddles

Joanne Barnieu, M.S.,  
Steven Aude, Ph.D., Angela Ferreira, Ph.D., M.P.S.,  
Heidi-Keller Glaze, Ph.D., Kate Lambourne, Ph.D.,  
Ryan Riley, M.A., MaryAnn Stassen, M.S.  
ICF Incorporated, LLC.  
Reston, VA  
[joanne.barnieu@icf.com](mailto:joanne.barnieu@icf.com),  
[steven.aude@icf.com](mailto:steven.aude@icf.com), [angela.ferreira@icf.com](mailto:angela.ferreira@icf.com),  
[heidi.keller-glaze@icf.com](mailto:heidi.keller-glaze@icf.com), [kate.lambourne@icf.com](mailto:kate.lambourne@icf.com),  
[ryan.riley@icf.com](mailto:ryan.riley@icf.com), [marvann.strassen@icf.com](mailto:marvann.strassen@icf.com)

Nathanael Keiser, Ph.D.,  
Christopher Vowels, Ph.D.  
U.S. Army Research Institute  
Fort Cavazos, TX  
[nathanael.l.keiser.civ@army.mil](mailto:nathanael.l.keiser.civ@army.mil),  
[christopher.l.vowels.civ@army.mil](mailto:christopher.l.vowels.civ@army.mil)

### INTRODUCTION

Traditionally, the Army has excelled at preparing soldiers tactically and technically for the rigors of deployment and combat. However, the Army has identified maximizing soldier, leader, and team human potential as key to multi-domain operations (MDO) success (Department of the Army, 2018; 2022). Thus, in addition to tactical and technical skills, the assessment and development of the psychological, intangible aspects of small unit performance is needed to maximize soldier and small unit readiness and effectiveness. An “intangible” has been used to describe “psychological concepts that contribute to soldier mission readiness across the human dimension” (Vowels & Aude, 2019, p. 2) and includes constructs such as adaptability, self-awareness, warrior ethos, confidence, and resilience.

The U.S. Army Research Institute conducted a series of studies from 2010 to 2013 to identify and measure psychological intangibles (PI) relevant to individual soldier mission readiness (Aude et al., 2015; Aude et al., 2014; Aude et al., 2014). This research included an extensive review of the literature, data collection from active-duty soldiers, and development of field-valid measures. After assessing the most critical intangibles for soldier readiness and training needs, measures of initiative and perseverance were developed for use by Army units and piloted at a Medical Simulation Training Center (MSTC). During MSTC training, composite (ad hoc) squads conduct combat field medical tasks under demanding and realistic field settings (e.g., downed aircraft, extracting an injured soldier [training manikin] out of a tank turret). MSTCs are optimal settings for pilot testing measures because they operate Army-wide at key unit troop locations/installations, and soldier MSTC participants are drawn from every unit in the Army (primarily enlisted and junior noncommissioned officers [NCOs]) due to initial and recertification Department of Defense (DOD) medical readiness training requirements (DoD, 2022).

The current research extended the previous individual focus on PI to teams operating in the envisioned MDO environment. To accomplish this, team theory and research was leveraged to determine how to define, measure, and model PI at the team level. Known indicators and measures were also adapted to identify a set of factors likely to be predictive of squad performance during training lanes and exercises. Measures of seven team-based PI were developed and validated across several data collections at MSTC, resulting in a final version of the PI assessment form. Table 1 provides the seven team-based PI found on the final version of the PI assessment form. On the form, each PI includes several squad-level behavioral statements to be measured using a five-point effectiveness scale (very ineffective, ineffective, neither effective nor ineffective, effective, very effective).

**Table 1. Seven Psychological Intangibles**

	<b>Psychological Intangible</b>
<b>1</b>	Communication
<b>2</b>	Support Each Other
<b>3</b>	Initiative
<b>4</b>	Adaptability
<b>5</b>	Perseverance

6	Shared Leadership
7	Formal Leadership

The present research also included the validation and delivery of an assessment, feedback, and developmental resources toolkit designed for use by instructors observing or otherwise working with squad-sized units. While this paper touches on the PI assessment for contextual purposes, its focus is on the evolution of the feedback strategy to be executed by instructors who observe and rate squad-level PI during a training exercise. First, the research team was interested in a feedback strategy that would focus primarily on the PI (versus tactical and technical performance indicators). Second, we wanted to explore how feedback on PI could impact subsequent squad PI performance in the same training exercise if given mid-way through or at an obvious pause in action. Finally, since the prior and current research involved identifying and validating PI likely to be predictive of tactical/technical squad performance, we infer that improved squad-level PI leads to improved squad performance. Through this relationship, we could explore whether an interim feedback strategy based on PI leads to improved squad-level PI, hence improved squad performance.

The MSTC training exercise is broken down into outdoor and indoor portions with a short break in between for the participating squad, rendering it an ideal situation for an interim feedback strategy. As such, a short, interim strategy was designed so instructors could engage with the squad between the outdoor and indoor portions. In the feedback strategy, the instructor would provide feedback on the seven PI assessed during the first portion of the exercise and leverage the PI assessment form ratings to formulate the feedback content. This interim technique was coined the “squad huddle.” A PI-focused squad huddle in the midst of a training exercise would prove to be a somewhat novel concept, as Army soldiers are typically provided feedback on tactical and technical performance indicators after completion of the training exercise in the form of an after-action review (AAR). Though the concept does mirror previous research on team dimensional training conducted in a simulation environment (Smith-Jentsch, et al., 1998), in this case, we worked in a live training environment and introduced a very brief training aid. The intent of the squad huddle was not to replace the staple summative feedback approach (the AAR) used in Army training and education for decades. Rather, conducting a huddle during the training supports how small units learn and apply their learning *in-the-moment* to have an immediate impact on subsequent performance.

## HUDDLE DESIGN

When the concept of the squad huddle was first introduced, its original design prompted instructors to review PI ratings from the outdoor portion of the training exercise and write down feedback in its simplest form—what should the squad “keep doing, start doing, and stop doing?” The PI assessment form contained space for noting feedback, and the intent was for the instructor to refer to the notes on the form when executing the squad huddle. A brief, verbal training was provided to instructors (prior to the commencement of their duties) on how to complete the PI assessment form. The training was easily amended by adding information on how to prepare for and execute the squad huddle. MSTC instructors and their Non-Commissioned Officer-in-Charge (NCOIC) indicated that pausing to complete a huddle might defeat the purpose of ramping up soldier stress and fatigue, making for a less than realistic combat casualty scenario. Further, it was an instructor norm to hold a more thorough AAR with each squad at the conclusion of the indoor exercise, so there was a risk that instructors would not understand why an interim feedback session was necessary or possibly would not view the squad huddle as having a different purpose than the AAR. Finally, it was also inferred by instructors that the requirement to formally rate the squad on PI and to scan through these ratings to prepare for and execute a huddle represented an additional burden, potentially taking time away from the more important task of assessing technical, and to a lesser extent, tactical competence. The multiple forms of initial instructor reactions led to identifying ways to frame the squad huddle that would render it more acceptable and generate instructor “buy in.”

## Literature Search

Due to the squad huddle’s attributes (e.g., brief, interim, impactful), a parallel was drawn between the squad huddle and a sports timeout. A coach’s ability to control the content during a timeout allows him or her to draw the attention of the players to certain aspects of the competition (and away from others), keeping them focused on the message at that moment more so than any other time (Mann, 2012). This timeout feature aligns well with an instructor striving to draw the squad’s attention to PI and away from tactical/technical performance. Sports psychology literature was

explored to provide insight into how the squad huddle could resemble a sports match (competitive game) timeout, which typically lasts approximately two minutes. More generally, feedback best practices found in assessment and development literature were investigated to see if the huddle design could be improved or should encompass elements beyond “keep doing, start doing, stop doing.” The findings from literature and best practice reviews are summarized below, followed by a description of the refinements made to the squad huddle design.

### **Balance of Positive and Constructive Feedback**

In reviewing sports psychology literature, the team discovered that when feedback is provided in the midst of task performance, there is more focus on influencing the rhythm of the task performance than on improving individual technical or tactical skills (Mann, 2012). Though we were not measuring arousal or perceived anxiety in the current research, we were very much interested in using available practices to positively impact performance. According to the zone of optimal performance, an individual’s performance is enhanced by higher amounts of physiological arousal up to an optimal point but can be negatively affected with too little or too much arousal (Arent & Landers, 2003; Hannin, 1978). When considering this, feedback delivery should involve a balance of positive reinforcement (what is going well) and constructive feedback (what is not going well and needs adjustment) to target team members where they are in the zone of optimal performance; meaning that some team members might be at, and perform well at, a very heightened arousal while others are at a moderate or low level. If this balance is not achieved, there is a risk that some team members will experience increased arousal beyond their optimal point, while other team members may not experience enough arousal (depending on where they are in the zone of optimal performance). What could result are team members whose performance decreases following the feedback session (Andrews, 2015). In reviewing feedback best practices literature, it was highlighted that both positive and constructive feedback can best promote learning (Ellis & Davidi, 2005) as long as constructive feedback focuses on the behavior and not the person (Kluger & DeNisi, 1996). Focusing on the person can decrease trainees’ confidence and motivation to learn.

### **Clear Feedback-Standard Gap**

The literature on feedback best practices shows that reducing ambiguity around goals and standard performance is a key element to providing feedback on training performance. Trainee feedback should clearly indicate the feedback-standard gap. Clear goal setting increases the chance that feedback will motivate an individual to attain the goal as opposed to focusing one’s attention on reducing the negative feedback (Gregory & Levy, 2015). With a clear feedback-standard gap, the feedback focuses on how the trainee’s performance fell short of an established goal. Without a clear feedback-standard gap, trainees tend to focus on “self-goals” or meta task processes, whereby the trainee adopts performance-prove or performance-avoid goals and overlooks mastery goals, such as the desire to attain favorable feedback, avoid being perceived as incompetent, or prove the feedback provider wrong (Elliot & Church, 1997; Taylor et al., 1984). The consensus among researchers is that mastery goals are generally associated with better training performance and outcomes (e.g., Brown & Ford, 2002; Heimbeck et al., 2003).

### **Focus on the Critical Time Allotted**

Related research suggests that overloading individuals with information during a feedback session may be ineffective since some of the feedback may not be fully processed in their working memory (Sweller, 1988) and therefore not immediately useful for task performance. Further, if the feedback session is brief, such as with a sports timeout, the coach does not have the luxury of time to provide a large amount of information. The sports psychology literature confirmed that when athletes are in the midst of the adrenaline and rhythm of performing, they can only process and retain a limited amount of information in a timeout and need some time to prepare to take in critical information (Andrews, 2015). Additionally, Andrews (2015) emphasized that an effective timeout plan uses a three-phased approach that starts first with providing some time for team members to catch their breath. Since team members are not processing critical information during the first phase, it is best to make only positive and simple statements to manage the team’s emotions (e.g., “good job”). Next, a specific observation of positive behavior is provided, followed by two (if possible) specific performance concerns to include how to adjust or improve. In the third phase, the timeout concludes with the coach checking for an understanding of the three observations made and then asking the team to shout out a simple message about what the team will focus on when performance resumes (e.g., “block more shots”).

### **Huddle Draft**

Concerning adrenaline, the squad’s situation would be comparable to athletes in the first few seconds of a timeout, with squad members having just completed an intense training activity and soon returning to an activity of similar or greater intensity. Therefore, any feedback provided within those first few seconds of the huddle is less likely to be

processed. Similarly, with the time constraint, it would be best to focus only on critical information. Additionally, to strike this balance of both positive and constructive feedback, the squad huddle should still include the original simple elements of what the squad should continue doing as well as what the squad needs to stop doing and adjust yet should incorporate specific examples. A specific incident could then be tied to a goal for which the squad fell short, to more clearly indicate the feedback-standard gap. Further, when providing constructive feedback, the instructor should focus on the behaviors observed and not refer to the attitudes or personality traits of the squad members. While the focus of the squad huddle is on PI behaviors and not tactical behaviors, the instructor should connect to the training task and specific training goals when providing feedback. For example, if the training task is to perform combat casualty care, the instructor alludes to falling short of the task by providing context such as “When you were attempting to retrieve the casualty from the tank, I noticed that you were not clearly communicating with one another about your intention to move the casualty, so other team members were getting in the way.” This statement more clearly indicates the feedback-standard gap than simply stating, “I noticed you were not clearly communicating with one another.” The latter might permit the squad members to focus on “self-goals” or to avoid receiving similar feedback after another iteration of training, rather than focusing on using clear communication to successfully attend to casualties. Consistent with typical sports timeouts, the squad huddle should be short in duration and last no more than three to four minutes.

### **Huddle Steps and Job Aid**

The design of the squad huddle was modified to reflect the three-phased approach (Andrews, 2015) in the following manner: (Phase 1) Allow trainees to put weapons down, drink water, put arms in ice bath, etc., while instructor makes a simple positive comment about performance; (Phase 2) Start by providing a specific example of a PI behavior that was helping team performance followed by a specific example(s) of PI behaviors that were impairing team performance and how the team could adjust upon return to the training exercise; and (Phase 3) Check for understanding of what the team heard in Phase 2 by asking them to shout out what they will do better upon return to the training exercise.

To support this three-phased approach, the section of the PI assessment form that provided space for the instructor to write down what the squad should “keep doing, start doing, and stop doing” was removed. As part of the modification, a supplemental Squad Huddle Job Aid was created, in the form of a standard 8 ½” by 11” sheet of paper. The job aid reflected the three phases identified in the literature search and incorporated a new design with five steps:

- Step One – Be prepared with ratings of the psychological intangibles and specific examples
- Step Two – Gather squad members in a huddle while providing brief, positive statements
- Step Three – Focus on what is helping the squad performance
- Step Four – Focus on what is impairing the squad performance and how to adjust
- Step Five – Check for understanding

### **HUDDLE PILOT**

The same instructors conducting the huddle initially were present in subsequent data collections, thus they were given a refresher on how to complete the PI assessment form. These instructors were familiar with the huddle from the prior data collections; however, the job aid, which reflected the sports timeout design, was new to them. Thus, for the huddle pilot, the job aid was briefly presented to instructors, and they received a copy to carry along with their PI assessment forms. The job aid, reflective of the new design, appeared to be effective, as instructors were seen referring to it when conducting their huddles.

### **Observation of Huddles**

Instructors were observed as they conducted huddles and then provided feedback to improve huddle execution. Performance improvement was generally needed in the following areas:

- Instructors tended to begin immediately with constructive feedback rather than an initial statement of positive reinforcement.
- Instructor feedback was sometimes about tactical behaviors rather than the PI in terms of what the squad was doing well and what required improvement.

- Instructors were often providing vague feedback on PI behaviors such as “you need to communicate better” rather than referring to specific behaviors such as “sending clear information” or “acknowledging requests of other members.”
- The feedback lacked examples.
- Some instructors spent too much time in the squad huddle (resembling a more formal AAR).

### **Advocacy/Inquiry Model**

While conducting the squad huddle, it was observed that an instructor inserted a step between step two (gather squad members) and three (focus on what is helping) on the job aid, during which time the instructor asked squad members what they thought of their squad performance. This is a common practice employed in the Army during quick debriefs and more formal AARs (see also Smith-Jentsch, et al., 1998). This self-assessment allowed the instructor to confirm those observations in steps three and four or provide a different perspective if applicable. This approach closely relates to employing advocacy and inquiry (A/I) in a non-judgment debriefing situation (Rudolph et al, 2007). Employing A/I in a debriefing mode typically involves a facilitator first providing his or her perspective, underlying interests, and reasoning behind the perspective in a non-judgmental way, and then asking others their perspective on the situation. The facilitator also invites the group to inquire about others’ perspectives and associated reasoning. The goal of this communication approach is to combine advocacy with inquiry; therefore, the flow can be reversed such that the facilitator starts first with inquiry (asking about others’ perspectives), followed by advocacy (their own non-judgmental assessment). The invitation to express one’s viewpoint is explicit and manifests as a conversation (versus a monologue), creating a condition for mutual learning (Argyris & Schon, 1974). As teams continue to work together, the facilitator can model A/I behavior such that team members begin to employ the strategy among themselves informally during brief training pauses, with potential for continuous improvement of team communication and increased shared understanding (see also Smith-Jentsch, et al., 2008).

The combination of the squad’s self-assessment (prompted by instructor inquiry) and then the instructor’s non-judgmental, behaviorally-based perspective (advocacy) is a strategy for increasing psychological safety. Having a sense of psychological safety means that squad members are more likely to take interpersonal risks because there are no negative consequences (Ashauer & Macan, 2013). By first asking the squad members about their own self-assessment, they are put at ease and feel comfortable sharing their perspectives. Conversely, if the instructor proceeded to provide constructive feedback, this could decrease psychological safety and result in the squad members agreeing with the instructor instead of providing their own assessment.

### **Finalization of Huddle Design and Job Aid**

After a literature search confirmed that asking squad members for a self-assessment was appropriate, this step was added before the instructor provides feedback on the PI behaviors. Consistent with the huddle resembling a timeout and in the midst of performance, instructors would emphasize brevity during this step. Step one (be prepared with PI ratings and examples) was eliminated since this step mainly referred to preparation, and the PI assessment form already provided a section for the instructor to prepare this information. This meant that the job aid still included five steps, starting with gathering the squad members in a huddle, during which time the instructor provides brief, positive messages.

At subsequent data collections, new instructors were present, and a longer training session was instituted (the day before) that covered how to complete the PI assessment form and how to use the job aid to prepare for and execute the squad huddle. Instructors were provided with an opportunity to practice executing the huddle via role plays. The next day, the revised step two (self-assessment based on the A/I model) was used in the squad huddle. It was determined that some instructors were spending too much time on revised step 2. This step’s instructions were clarified, indicating that the instructor would ask for feedback from a sample of two to three team members rather than all squad members and ask them to state their feedback in a few words or single sentence at most.

Following one of the data collections, some instructors mentioned it would be easier to have the job aid on a small card that could be flipped to a reverse side and placed on their clipboards (see Figure 1). The front side of the card would include the five steps and guidance, and the reverse side of the card would provide instructors with some space to formulate what they would say during the huddle. Some of the steps involved simple phrasing that could be easily repeated for each squad in the training exercise; therefore, the reverse side of the card was modified to include recommended phrasing for those steps.

Squad Huddle Job Aid		Squad Huddle Feedback Card	
(Huddles are 3 to 4 minutes total)		Date	Squad #
		Instructor #	
1	<b>Gather squad members in a huddle</b> <ul style="list-style-type: none"> <li>Let squad members catch their breath and get water.</li> <li>Provide <b>positive feedback</b> with short phrases such as: "Good work!"   "You made it!"   "Get some water!"</li> </ul>	<b>Step 1: Gather in a Huddle; Short Positive Statements</b> <i>Good work! You made it. Get some water.</i>	
2	<b>Ask squad members for a self-assessment on the squad's performance</b> <ul style="list-style-type: none"> <li>Ask 2-3 squad members what the squad did well, followed by what the squad did not do well.</li> <li>Ask for 1 or 2 word answers only (quickly).</li> </ul>	<b>Step 2: Ask Squad Members for a Self-Assessment</b> <i>How did that go? Let's hear from 2-3 people, and keep it to a few words...</i> <i>What are 1 or 2 things the squad did well?</i> <i>What are 1 or 2 things the squad did not do well?</i>	
3	<b>Provide feedback on what is helping squad performance</b> <ul style="list-style-type: none"> <li>Tell the squad what they were <b>doing well</b> and should continue (1 or 2 of the psychological intangibles).</li> <li>Provide specific examples observed during the exercise.</li> </ul>	<b>Step 3: Provide feedback on what is <u>helping</u> squad performance</b>	<b>Step 4: Provide feedback on what is <u>impairing</u> squad performance, and how to adjust</b>
4	<b>Provide feedback on what is impairing squad performance, and how to adjust</b> <ul style="list-style-type: none"> <li>Tell the squad what was <b>not done well</b> and how to improve (1 or 2 of the psychological intangibles).</li> <li>Provide specific examples observed during the exercise.</li> </ul>	<small>[Record notes on 1-2 categories from the assessment form, with specific behaviors]</small>	<small>[Record notes on 1-2 categories from the assessment form, with specific behaviors]</small>
5	<b>Check for understanding</b> <ul style="list-style-type: none"> <li>Ask squad members what they will <b>start doing</b>.</li> <li>Prompt them for <b>one word or a short answer</b>, such as: "Help each other!"   "Communicate better!"</li> </ul>	<b>Step 5: Check for Understanding</b> <i>So quickly....</i> <i>What is the one thing you can do better as a squad, going into this next exercise?</i>	

Figure 1. Squad Huddle Job Aid (Front and Back)

## HUDDLE QUASI-EXPERIMENT

In the final data collections and once the job aid design was finalized, a quasi-experiment was conducted to determine the impact the squad huddle had on the squad's subsequent PI and performance ratings (during the indoor portion of the training exercise). This would involve comparing the squad-level PI and performance ratings on the PI assessment form from the outdoor and indoor portions of the exercise for each squad. Other factors could contribute to improved squad-level PI in the second portion of the training exercise (e.g., self-reflection, different tasks); therefore, a control group could indicate if the use of the squad huddle in between the two portions of the training exercise impacted squad-level PI and subsequent performance. The present research involved validation of identified PI as representing team processes or emergent states that impact task outcome. To support this validation, the PI assessment form contained a section for instructors to rate tactical/technical performance following their squad-level PI ratings. As such, squad performance ratings were also compared for the control and treatment groups to determine rating differences.

## Methods

For the purposes of this research, a between subjects, quasi-experimental design was utilized. Random assignment of squads to treatment (huddle) and control (no huddle) groups was not possible given the nature of the MSTC school training environment and schedule. The rapid pace of squad training throughput would have likely resulted in the use of the huddle, or similar forms of instructor coaching, for squads not designated to receive it. Therefore, the experiment was conducted with non-randomly assigned squads subjected to either a huddle (treatment group) or the training experience without a huddle (control group). Assignment was based on which week the data collection occurred (e.g., all squads were assigned to control, or all were assigned to treatment for that given week) with the exception of one instance when assignment was split between treatment (first few squads) and control (remaining few squads) in the same data collection to ensure even numbers for both groups.

## Participants

Both the control and treatment groups consisted of twelve squads each for a total of 24 ad hoc squads. MSTC training squads consist of individual soldiers attending the five-day Tactical Combat Casualty Care (TCCC) course. The soldiers came from various units and Army components (e.g., Active duty, National Guard). Soldier grades were primarily junior enlisted (E-1 to E-4) and junior non-commissioned officer (NCO) (E-5 and E-6). Soldiers in more senior grades (officer and NCO) were rare and typically came from National Guard units attending TCCC in preparation for deployment. The MSTC instructors randomly assigned soldiers to the ad hoc squads and most often appointed the junior-most person to serve as the squad leader. For the treatment group, those MSTC instructors who completed the PI assessment form also facilitated the squad huddle. MSTC instructors ranged in grade from junior enlisted to Staff Sergeant. Given the unit of analysis was the squad, no individual soldier demographics were collected. Instructor demographics were also not collected.

## Procedure

The training exercise for both treatment and control groups started with the squads going through the outdoor portion of the exercise (casualty evacuation training lane). Following the outdoor portion, the observing MSTC instructor facilitated the huddle for the treatment group. The control group and treatment group were both given a brief break to drink water and cool down. Immediately following the break, squads in both control and treatment groups geared up and entered a warehouse-like building for the indoor portion of the exercise, which was deemed more challenging (mass casualty event). Again, the control group-designated squads went through the same outdoor and then indoor portions of the training exercise without experiencing the huddle. MSTC instructors completed the PI assessment for both the control and treatment groups twice; the first time based on their outdoor observations and the second time based on indoor observations.

A total of four data collections were conducted, with the first three alternating between control and treatment groups during a two-month period. The number of squads and their composition attending MSTC was generally known a week or two in advance, but trainee numbers could and did change up until the day of training. Consequently, the fourth data collection used a hybrid approach with the first half of squads as treatment groups and the second half as control groups. This approach was used to balance the total number of squads in the experimental and control groups across the available data collections.

## Results

Given sample size limitations, statistical analyses were limited to the calculation and comparison of mean scores together with indices showing the amount of change (+/-) in a mean score between outdoor and indoor PI assessment administrations. The differences of interest in this experiment were the mean score differences between outdoor and indoor ratings for the control and treatment groups. See Table 2 for PI variable and performance means by outdoor and indoor conditions for the treatment and control groups.

**Table 2. PI and Squad Performance Mean Scores by Outdoor/Indoor and Control/Treatment Group**

<b>Team-Based PI</b>	<b>Control (n = 12)</b>	<b>Treatment (n = 12)</b>
<b>Communication</b>	<b>M (SD)</b>	<b>M (SD)</b>
Outdoor (Casualty Evacuation)	3.34 (1.07)	3.17 (1.14)
Indoor (Mass Casualty)	3.46 (1.02)	3.40 (0.72)
<b>Difference from Outdoor to Indoor (+/-)</b>	<b>0.12(+)</b>	<b>0.23(+)</b>
<b>Support Each Other</b>		
Outdoor (Casualty Evacuation)	4.13 (0.64)	3.64 (0.84)
Indoor (Mass Casualty)	3.73 (0.75)	4.00 (0.72)
<b>Difference from Outdoor to Indoor (+/-)</b>	<b>0.40(-)</b>	<b>0.36(+)</b>
<b>Initiative</b>		
Outdoor (Casualty Evacuation)	3.67 (0.79)	3.20 (1.08)

Indoor (Mass Casualty)	3.58 (0.96)	3.75 (0.76)
<b>Difference from Outdoor to Indoor (+/-)</b>	<b>0.08(-)</b>	<b>0.55(+)</b>
<b>Adaptability</b>		
Outdoor (Casualty Evacuation)	4.04 (0.72)	3.50 (1.13)
Indoor (Mass Casualty)	3.71 (0.91)	3.83 (0.72)
<b>Difference from Outdoor to Indoor (+/-)</b>	<b>0.33(-)</b>	<b>0.33(+)</b>
<b>Perseverance</b>		
Outdoor (Casualty Evacuation)	4.49 (0.56)	3.83 (0.78)
Indoor (Mass Casualty)	4.11 (0.56)	3.97 (0.66)
<b>Difference from Outdoor to Indoor (+/-)</b>	<b>0.37(-)</b>	<b>0.14(+)</b>
<b>Shared Leadership</b>		
Outdoor (Casualty Evacuation)	3.92 (0.95)	4.00 (0.83)
Indoor (Mass Casualty)	3.63 (0.80)	3.63 (0.80)
<b>Difference from Outdoor to Indoor (+/-)</b>	<b>0.29(-)</b>	<b>0.38(-)</b>
<b>Formal Leadership</b>		
Outdoor (Casualty Evacuation)	3.80 (0.96)	3.73 (0.85)
Indoor (Mass Casualty)	3.68 (0.78)	3.61 (0.76)
<b>Difference from Outdoor to Indoor (+/-)</b>	<b>0.12(-)</b>	<b>0.12(-)</b>
<b>Squad Performance</b>		
Outdoor (Casualty Evacuation)	4.04 (0.67)	3.61 (1.08)
Indoor (Mass Casualty)	3.65 (1.07)	3.65 (0.68)
<b>Difference from Outdoor to Indoor (+/-)</b>	<b>0.39(-)</b>	<b>0.04(+)</b>

Recognizing that sample size precludes definitive findings on huddle efficacy, PI mean scores trended in ways that indicated those squads who experienced the huddle improved or at least maintained PI performance when faced with a more challenging task environment (indoor). Lower leadership scores, both formal and shared, may indicate squad members collectively, through the emergence of effective group behaviors, play a greater role in squad performance as the training progresses. It may also mean that the MSTC instructor-appointed squad leaders (the most junior grade individuals) adequately led the outdoor evacuation tasks, but their lack of experience contributed to lower leadership ratings during the more demanding indoor mass casualty exercise. It is also important to note that the huddle occurring between outdoor and indoor lanes focuses largely on what *the squad* needs to improve on rather than on what individuals (e.g., the squad leader) need to improve.

## DISCUSSION

We recognize that this quasi-experiment did not involve a comparison of the squad huddle design with other interim feedback or informal feedback strategies. Additionally, conducting research during a set sequence of training activities did not allow for sufficient controls of other potentially influencing variables (e.g., feedback provided to squads outside of the huddle). Thus, inferences of causality are limited, but there was a positive trend of the results for the treatment squads between the outdoor and indoor portions of the training. Specifically, the treatment group showed improvement in squad performance from outdoor to indoor (0.04(+)), while the control group evidenced a decline in performance (0.39(-)) (See Table 2). Therefore, it can be inferred that squad huddles focused on team-based PI may be influencing PI-relevant behaviors such that squad performance improves even as task difficulty increases. In sum, a measurement of team-based PI and performance was assessed during MSTC ad hoc squad training lanes. A ready-to-use squad huddle job aid, based on the tenets of a sports timeout, was produced to improve training performance. Assessment of team-based PI and use of a huddle hold potential for performance improvement and squad-size unit

sustained MDO performance. These same assessment and feedback tools may hold potential for broader military services and civilian applications.

### **Other Use Cases for the Squad Huddle**

Assessment of squad-level PI and use of a squad huddle could extend beyond live training and apply to virtual training contexts such as the Army's Synthetic Training Environment (STE). As long as teams, squads, and crews are training together, observers can rate team-based PI (using the PI assessment form) and find a pause in action to execute a huddle. Virtual training may need to be modified to better reflect the reality that there are "lulls" in the action. Huddles could make simulation time more efficient in that crews would huddle briefly during pauses in the action and use what they learned in their remaining simulation time.

Outside of a military context, huddles could be used in situations where waiting to address performance can result in life threatening situations. Any number of responders, be they firefighters, law enforcement, emergency medical technicians, as well as other teams operating in the midst of performing emergency services could likely apply and benefit from the huddle. Service teams such as restaurant kitchen and wait staff could also use the huddle when brief lulls occur during hectic shifts to quickly discuss what is working well and what needs improvement to better serve customers for the remainder of the shift. Further, huddles could also serve action learning projects that are typically part of organizational leadership training programs. As effective learning opportunities, action learning projects involve a designated team that collaborates to solve real-life organizational challenges (McGill & Brockbank, 2004). The team meets regularly to discuss what they are working on (outcomes) but also holds regular sessions to discuss how they are working together (team processes). Finally, meeting facilitators or educators can rate team PI and, midway through a session or activity, pause for a team huddle in the effort to improve PI behaviors upon return to the session or activity, leading to higher group effectiveness and productivity.

### **Future Research**

In future research, additional team-based PI tools might be developed and systematically compared to the effectiveness of the huddle in improving team performance. One might hypothesize that actual formal training on team-based PI would improve performance beyond that of a huddle (Smith-Jentsch, et al., 1998; 2008). Yet, such an experiment might demonstrate that training provides little to no extra value beyond that provided by a three-minute feedback session (huddle). Thus, teams could become more efficient and effective with interim tools such as the huddle, more so than with resource intensive training sessions.

### **ACKNOWLEDGEMENTS**

Appreciation is extended to the Clarence E. Sasser Medical Simulation Training Center (MSTC) at Fort Cavazos, TX. The MSTC staff and instructors were especially instrumental in supporting this research by allocating significant time towards its implementation. Their feedback in developing, and iteratively revising, the measure and the training aid were critically important. And thanks go to the soldiers formed into ad hoc squads to experience the challenging and arduous simulated combat casualty care and evacuation MSTC training lanes.

### **REFERENCES**

- Andrews, S. R. (2015). Emotional control and instructional effectiveness: Maximizing a timeout. *Strategies*, 28, 33-37. <https://doi.org/10.1080/08924562.2014.1001104>.
- Arent, S. M., & Landers, D. M. (2003). Arousal, anxiety, and performance: A reexamination of the inverted-U hypothesis. *Research Quarterly for Exercise and Sport*, 74(4), 436-444. <https://doi.org/10.1080/02701367.2003.10609113>.
- Argyris, C., & Schon, D. A. (1974). *Theory in practice: Increasing professional effectiveness*. Oxford, England: Jossey-Bass.

- Ashauer, S. A. & Therese Macan, T. (2013) How Can Leaders Foster Team Learning? Effects of Leader-Assigned Mastery and Performance Goals and Psychological Safety, *The Journal of Psychology*, 147:6, 541-561, DOI: 10.1080/00223980.2012.719940.
- Aude, S. N., Bryson, J., Keller-Glaze, H., Nicely, K., & Vowels, C. (2014). Preparing brigade combat team soldiers for mission readiness through research on intangible psychological constructs and their applications, Phase I (Technical Report 1336). U.S. Army Research Institute for the Behavioral and Social Sciences.
- Aude, S. N., Keller-Glaze, H., Nicely, K., Shuffler, M., & Vowels, C. (2014). Preparing brigade combat team soldiers for mission readiness through research on intangible psychological constructs and their applications, Phase II: Measurement and learning methods (Technical Report 1333). U.S. Army Research Institute for the Behavioral and Social Sciences.
- Aude, S. N., Nicely, K., Lodato, M. A., & Vowels, C. L. (2015). Preparing brigade combat team soldiers for mission readiness through research on intangible psychological constructs and their applications: Validation and pilot (Army Research Technical Report 1348). U.S. Army Research Institute for the Behavioral and Social Sciences.
- Brown, K. G., & Ford, J. K. (2002). Using computer technology in training: Building an infrastructure for active learning. In K. Kraiger (Ed.), *Creating, implementing, and managing effective training and development* (pp. 192-233). Jossey-Bass.
- Department of the Army (2022). *Field Manual 3-0, Operations*. Washington, DC: Author.
- Department of the Army (2021). *Field Manual 7-0, Training*. Washington, DC: Author.
- Department of the Army (2018). *TRADOC Pamphlet 525-3-1, The U.S. Army in Multi-Domain Operations 2028*. Washington, DC: Author.
- DOD Instruction 1322.24, "Medical Readiness Training," February 15, 2022.
- Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology*, 72, 218-232.
- Ellis, S. & Davidi, I. (2005). After-event reviews: Drawing lessons from successful and failed experience. *Journal of Applied Psychology*, 90, 857-871.
- Gregory, J. B., & Levy, P. E. (2015). *Using feedback in organizational consulting*. American Psychological Association. <https://doi.org/10.1037/14619-000>.
- Hanin, Y. (1978) A study of anxiety in sports. In W.F. Straub (Ed.), *Sport Psychology: An analysis of athlete behavior*. (pp. 236 - 249). Movement Publications: Ithaca, NY.
- Heimbeck, D., Frese, M., Sonnentag, S., & Keith, N. (2003). Integrating errors into the training process: The function of error management instructions and the role of goal orientation. *Personnel Psychology*, 56, 333-361.
- Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, 119(2), 254-284.
- Mann, M. D. (2012). Systematic observation of coach feedback in elite youth volleyball. *Theses and Dissertations*, 339. <http://scholarworks.uark.edu/etd/339>.
- McGill, I. & Brockbank, A. (2004). *The Action Learning Handbook*, New York: Routledge.
- Rudolph, J. W., Simon, R., Rivard, P., Dufresne, R. L., & Raemer, D. B. (2007). Debriefing with good judgment: combining rigorous feedback with genuine inquiry. *Anesthesiology clinics*, 25(2), 361-376.
- Smith-Jentsch, K. A., Canon-Bowers, J. A., Tannenbaum, S. I., & Salas, E. (2008). Guided team self-correction: Impacts on team mental models, processes, and effectiveness. *Small Group Research*, 39, 303-327.
- Smith-Jentsch, K. A., Zeisig, R. L., Acton, B., & McPherson, J. A. (1998). Team dimensional training: A strategy for guided team self-correction. In J. A. Canon-Bowers and E. Salas (Eds.), *Decision making under stress: Implications for individual and team training* (pp. 271-297). Washington, DC: American Psychological Association.

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12 (2), 257-285.

Taylor, M. S., Fisher, C. D., & Ilgen, D. R. (1984). Individuals' reactions to performance feedback in organizations: A control theory perspective. In K. M. Rowland & G. R. Ferris (Eds.), *Research in personnel and human resources management* (pp. 81-124). JAI Press.

Vowels, C. L., & Aude, S. (Nov 2019). The Psychological Intangibles of Soldier Readiness Part I: The Concept. *NCO Journal*. <https://www.armyupress.army.mil/Portals/7/nco-journal/images/2019/November/Intangibles-1/Measuring-Intangibles.pdf>.

The research described herein was sponsored by the U.S. Army Research Institute for the Behavioral and Social Sciences, Department of the Army (Contract No. W911NF-20-C-0036). The views expressed in this presentation are those of the author and do not reflect the official policy or position of the Department of the Army, DOD, or the U.S. Government.