Commentary of the Transferability of Esports to Military and Emergency Responder Roles

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Abstract

This commentary examines the potential application of esports research to military and emergency responder roles. It highlights similarities between competitive gaming and operational environments, focusing on cognitive performance under pressure. The commentary explores how esports-derived knowledge could enhance recruitment, training, and performance in areas like rapid decision-making, strategic thinking, team coordination, and stress management. Potential applications include cognitive assessment, simulation training, and stress inoculation. While acknowledging challenges and limitations, the commentary suggests significant potential for leveraging esports insights in high-pressure occupational settings. However, further targeted research is needed to validate skill transfer and address ethical considerations in these real-world contexts.

Keywords: Esports; Military; Cognitive Performance; Skill Transfer

Introduction

The contemporary and prospective battlefield is undergoing a significant overhaul owing largely to technological progress, notably in artificial intelligence and robotics (Scharre, 2023; Hawley, 2022). Consequently, there is a marked increase in the cognitive demands placed on personnel, stemming from the integration of these new capabilities and the expedited decision-making necessitated by advancements in weaponry and the deployment of smaller units (Billing et al., 2021; Seshadri et al., 2016). This presents an interesting paradox: while new technologies are ostensibly designed to support and sometimes replace human activities, they often simultaneously increase, rather than reduce, the cognitive load placed on human operators who must monitor, control, and make decisions based on these systems (Hancock, 1989; Parasuraman & Riley, 1997; Sharpe & Tyndall, 2025). These evolving cognitive requirements, alongside their traditional demands, such as maintaining situational awareness, managing communication, and making sound decisions based on auditory and visual cues, underscore the complexity of modern military operations (Endsley, 2015; Kaarstad & Torgersen, 2017; Blacker et al., 2019). Moreover, the proliferation of cognitive tasks extends beyond dismounted roles to encompass vehicle operators and the emergence of new roles, such as video display unit operators (e.g., unmanned vehicle operators and sensor monitoring personnel). While these changes primarily impact military personnel, technological advancements are also amplifying the cognitive demands in various physically demanding roles. For instance, search and rescue organizations have begun leveraging drones for tasks like locating casualties and transporting medical supplies across challenging terrain

(Braithwaite, 2018). Collectively, there is growing interest in comprehending the interplay between physical and cognitive performance and exploring avenues to optimize cognitive capabilities within demanding environments. Research has consistently demonstrated bidirectional relationships between physical and cognitive performance, with studies showing that physical fitness can enhance cognitive function (Chang et al., 2012; Mandolesi et al., 2018), while cognitive fatigue can impair physical performance (Van Cutsem et al., 2017). Harnessing knowledge from domains outside of occupational research, such as video gaming, may be one method for expediting the knowledge generation process (see Army, 2024; Strategic Command, 2024 for related events). Indeed, seeking expertise and methodologies from adjacent fields is a well-established approach in scientific advancement, particularly when addressing complex, multifaceted challenges that span traditional disciplinary boundaries (Repko & Szostak, 2020; Klein, 2010).

The ascent of electronic gaming (also referred to as video gaming) as a dominant form of entertainment is underscored by the remarkable success of titles like Minecraft, which had amassed sales figures of 238 million copies by 2021 (ActivePlayer, 2024). Other games with massive player bases that may be more translatable to military and emergency responder environments include Call of Duty: Warzone, with over 100 million players as of 2022 (Kerr, 2021), Microsoft Flight Simulator, which reached 10 million players in 2023 (Microsoft, 2023), and Counter-Strike with 1.34 million concurrent players (Statista, 2024). These games offer transferability to military contexts: Call of Duty simulates tactical combat scenarios requiring quick decision-making under pressure; Microsoft Flight Simulator provides realistic aircraft operation experience that develops spatial awareness and procedural adherence; and Counter-Strike demands team coordination, tactical planning, and split-second reactions in structured objective-based scenarios (Bennett, 2017; Kokkinakis et al., 2020). These examples demonstrate the widespread appeal of both shooting and simulation genres within certain demographics, though it should be noted that gaming preferences vary significantly across different age groups, cultures, and regions (Newzoo, 2023; Vermeulen & Van Looy, 2016). Despite their widespread popularity, video games represent a relatively modern phenomenon, continually evolving alongside technological advancements, fostering a growing diversity among genres. This ongoing evolution presents a distinct and compelling avenue for research, focusing on the psychological impact of video games on individuals (Sharpe et al., 2024a; Trotter et al., 2023). Significantly, within the domain of video game research, there exists a noticeable gap in studies exploring the nuances between various video game topics, including esports. Esports, specifically, denote the competitive engagement in video games that offer professional and personal development opportunities (Baker et al., 2024). This sector has witnessed substantial growth in funding, player participation, prize pools, and

viewership from 2018 through 2024, with global esports revenues increasing from approximately $865 million in 2018 to over $1.8 billion in 2023 (Newzoo, 2023; Statista, 2024; Hallmann & Giel, 2018; Jenny et al., 2018). Although esports may involve less physical activity compared to traditional sports, they do share several similarities. Tournaments typically feature players competing either individually or as part of teams, engaging in games structured into rounds and matches. Players often undergo rigorous training regimes, spending hours practicing each day, receiving professional coaching, and even securing sponsorships from corporations (Jacobs, 2015). Much like traditional athletes, professional esports players now follow structured training protocols, employ performance coaches and analysts, and adhere to regimens designed to optimize both physical and mental performance (Taylor, 2012; Pedraza-Ramirez et al., 2020; Nagorsky & Wiemeyer, 2022). During practice and competitions, players often endure extended periods without mental or physical breaks. Similarly, esports players must execute complex actions while simultaneously processing a range of stimuli to create fluid and coordinated gameplay, all while striving to minimize errors that could hinder their objectives. This high pressure cognitively demanding esport environment has increasing parallels with scenarios being increasingly encountered during military training and operations.

Electronic gaming and esports, once perceived as recreational activities, are now gaining recognition from employers for their ability to develop valuable skills. Different video game genres develop distinct skill sets based on their unique gameplay demands and structures (Granic et al., 2014; Pallavicini et al., 2018). Games in the real-time strategy (RTS) category, such as StarCraft, turn-based strategy games like Civilization, and puzzle games such as Pac-Man, nurture skills like decision-making, planning, concentration, and perseverance. Strategy games specifically develop resource management, long-term planning, and adaptive thinking (Kim et al., 2021), while puzzle games enhance pattern recognition and problem-solving under constraints (Spence & Feng, 2010). Conversely, single-player action-adventure games like Assassin's Creed may foster abilities such as spatial navigation, attention to detail, and quick reactive decision-making**,** while online multiplayer role-playing games like World of Warcraft and MMORPGs more broadly, may develop collaboration, communication, problem-solving, and judgment (Ducheneaut & Moore, 2005; Sourmelis et al., 2017). Some research suggests competitive first-person shooter esports, such as Counter-Strike, could potentially be associated with certain cognitive abilities, including working memory capacity and executive functioning, which involves reasoning, planning, though more rigorous research is needed to establish causal relationships (Boot et al., 2011; Gray et al., 2017). As research in this field expands, and given the significant cognitive demands experienced by esports players, it is likely that knowledge from this domain could be translated to benefit human performance in

military and occupational contexts. Research by Rosser et al. (2007) demonstrated that surgeons who regularly played video games made fewer errors and completed procedures more quickly than non-gamers, suggesting potential for skill transfer in highly technical fields. It's important to note that in the case of surgical procedures, particularly laparoscopy, the transferred skills are largely psychomotor in nature—including hand-eye coordination, fine motor control, and spatial awareness—rather than purely cognitive abilities (Jalink et al., 2014; Graafland et al., 2012). In fact, research continues to support these findings, with systematic reviews confirming positive correlations between video game experience and laparoscopic surgical skills (Glassman et al., 2016; Ou et al., 2013). It is therefore reasonable to speculate that there may be specific roles within the military and emergency services where skills developed through gaming might be relevant (e.g. video display unit operators). Alternatively, existing personnel could be exposed to electronic gaming and esports to familiarise them with contexts that may not be feasible due to concerns about inherent risks in their respective domains.

It's worth acknowledging that the relationship between gaming and military training has deep historical roots that long predate electronic gaming. The most notable historical example is the "Preußische Kriegsspiel" (Prussian Wargame), developed in the early 19th century by Lieutenant Georg Leopold von Reiswitz and refined by his son Georg Heinrich Rudolf von Reiswitz for the Prussian army (Perla, 1990; Sabin, 2012). This sophisticated military simulation used topographical maps, rule systems, and game pieces representing military units to train officers in strategic and tactical decision-making. The Kriegsspiel proved so effective that it was credited with contributing to Prussian military successes, particularly in the Franco-Prussian War of 1870-1871 (van Creveld, 2013). This historical precedent demonstrates that the current interest in leveraging esports for military applications is not merely a novel approach but rather an evolution of a long-established tradition of using games for military training and strategic development (Deterding, 2010; Frank, 2012).

The aim of this brief commentary is to provide an overview of knowledge transfer opportunities and applications, detail current knowledge transfer gaps, and highlight some research considerations and recommendations. However, given both fields have limited research, we are cautious to make any recommendations for direct practice and instead highlight potential areas for empirical exploration.

Similarities

Research suggests potential parallels between the cognitive requirements on military personnel and competitive esports players, particularly in specific roles such as video display unit operators or Remotely Piloted Aircraft Systems (RPAS) operators. It therefore offers

numerous opportunities for cross-domain learning and skill transfer. Military personnel face significant challenges in maintaining situational awareness and making rapid decisions under pressure (Walker et al., 2024). Separately, studies on esports players have identified cognitive demands including complex information processing and attention management (Toth et al., 2020). Team coordination is crucial in both domains, with military units relying on seamless coordination (Salas et al., 2008) and esports teams requiring clear communication to achieve objectives (Freeman & Wohn, 2017). Military operations require strategic planning that considers multiple factors (Jackson et al., 2017), while esports competitions similarly depend on strategic execution (Wang et al., 2015). Military personnel must maintain composure under extreme stress (Driskell et al., 2018), and esports players also face performance pressure during high-stakes competitions (Smith et al., 2022). Military roles require processing large amounts of information quickly (Endsley, 2015), while studies on MOBA players demonstrate schema-based information recall in fast-paced gaming environments (Bonny & Castaneda, 2016). Research on military personnel indicates the importance of vigilance during extended operations (Beckner et al., 2023), whereas studies with esports players demonstrate sustained attention requirements during competitive play (Valls-Serrano et al., 2022). Military training emphasizes adaptation to evolving technologies (Hyllengren, 2017), and elite esports players similarly demonstrate adaptability during gameplay (Himmelstein et al., 2017). While these parallels suggest potential for exploration, it's important to note that the consequences in military settings often involve potential injury or loss of life, while in esports, the risks are primarily financial or reputational. However, it should be acknowledged that competitive esports practice is not without physical and psychological health risks. Professional players frequently experience stress-related issues, burnout, and overuse injuries such as carpal tunnel syndrome and back problems from prolonged practice sessions (DiFrancisco-Donoghue et al., 2019; Zwibel et al., 2019). This parallels with another domain where simulation is used extensively to preserve physical safety: professional motorsport racing, where drivers regularly use sophisticated simulators to train for high-risk scenarios without physical danger, allowing for skill development while minimizing injury risk (Mullen et al., 2020).

Research Opportunities

The recognition of similarities between esports and the cognitively demanding job-tasks performed by military and emergency service personnel has led to growing interest in the potential for esports to serve as a recruitment tool for these occupations. As discussed in the Similarities section, research suggests esports players develop certain cognitive skills potentially applicable to some modern job roles in military and emergency services contexts. These include rapid decision-making, strategic thinking, team coordination, communication,

and the ability to process and act on complex information quickly (Bányai et al., 2019; Bowman et al., 2020; Yang et al., 2020; Leis et al., 2024; Gan et al., 2020). While the esports demographic remains predominantly male and young (Paaßen et al., 2017; Taylor, 2018), some organizations see value in connecting with this demographic. Recent data indicates that players of certain competitive games largely fall within military recruitment age demographics (18-35 years old) (Newzoo, 2023).

Several military organizations have already recognized these opportunities. For example, the United States Army has sponsored esports teams and tournaments as part of its recruitment strategy (Sacco, 2024). The British Army has also explored using esports as a recruitment tool, recognizing the overlap between gaming skills and those required in modern warfare (Ministry of Defence, 2019). However, it's important to note that while esports can be a valuable recruitment tool, it should be part of a broader, multifaceted recruitment strategy. Not all skills developed in esports will directly translate to military contexts, and traditional attributes such as physical fitness, discipline, and leadership qualities remain crucial for military personnel.

Training and Testing

Beyond recruitment, esports also offer potential opportunities for training and testing military and emergency responder roles. While traditional military simulations and wargames have existed for centuries, as exemplified by the Preußische Kriegsspiel mentioned earlier, contemporary simulations offer unprecedented levels of immersion, accessibility, and engagement (Frank, 2012; Perla & McGrady, 2011). Esports-style games —defined as video games specifically structured for organized competitive play with clear objectives, formal rulesets, and ranking systems (Hamari & Sjöblom, 2017)— could be adapted or developed to create realistic simulations of military scenarios, allowing personnel to practice decision-making and strategy in a safe, controlled environment (Pallavicini & Pepe, 2020). Esports-based tests could potentially be developed to assess cognitive skills such as attention management, information processing speed, and decision-making under pressure (Valls-Serrano et al., 2022). Team-based esports games could be used to train and assess team coordination and communication skills in a high-pressure, fast-paced environment (Freeman & Wohn, 2017). Competitive gaming environments could potentially be used as part of pressure training, helping personnel develop resilience to high-pressure situations (Sharpe et al., 2024b). Strategy-based games could be used to develop and assess strategic thinking skills, particularly for personnel in command-and-control roles (van den Bosch & Helsdingen, 2017). While these training and testing applications show promise, it's important to note that

they are still largely theoretical and would require significant research and development to implement effectively.

Applications and Transfer

While the physical environment of esports is largely static, typically involving players seated at computer stations for extended periods, the cognitive demands and skills required bear similarities to those encountered in military and responder settings, particularly those employing digital computing technology. The military environment, however, is arguably far more dynamic and includes additional stressors such as physical exertion, environmental extremes, and nutritional challenges (Lieberman et al., 2005). One of the most promising areas for application is in the realm of cognitive performance under pressure. Esports players, particularly at the professional level, routinely perform complex cognitive tasks under intense psychological pressure. This pressure, while not life-threatening, can be comparable in its cognitive impact to the pressure experienced by military personnel in high-stakes situations. Research has shown that expert video game players demonstrate enhanced attention allocation, higher resistance to distraction, and improved task-switching abilities compared to non-gamers (Green & Bavelier, 2012). These cognitive skills are directly relevant to military personnel who must maintain focus and make rapid decisions in chaotic, high-pressure environments. Thus, using esports could support the development of these desirable skills in operators.

The strategic thinking and decision-making skills developed through esports also have potential military applications. Many popular esports titles, particularly real-time strategy games, require players to manage resources, anticipate opponent actions, and adapt strategies in real-time. These skills align closely with the cognitive demands placed on military strategists and commanders. For example, prior literature has demonstrated that experienced real-time strategy game players demonstrated superior cognitive flexibility and planning abilities compared to non-gamers (Glass et al., 2013). This suggests that exposure to esports-style gaming could potentially enhance strategic thinking skills relevant to military planning and operations. Likewise, team coordination and communication, crucial elements in both esports and military operations, represent another area ripe for knowledge transfer. In team-based esports, players must communicate effectively, coordinate actions, and adapt to rapidly changing situations – skills that are equally vital in military contexts. Research has shown that team performance in esports is strongly correlated with communication quality and team cohesion (Höyng, 2022). The strategies and techniques used to foster this effective teamwork in esports could potentially be adapted to enhance team training in military settings.

The rapid information processing and decision-making required in many esports titles also have clear parallels to military tasks, particularly in roles involving complex systems or data analysis. For instance, the ability of expert gamers to quickly process visual information and make accurate decisions based on limited data (Li et al., 2020) could be valuable in roles such as RPAS operation or intelligence analysis. Some militaries have already recognised this potential; for example, the United States Air Force has explored using gamers for drone piloting roles due to their enhanced hand-eye coordination and ability to process multiple information streams simultaneously (Broersma, 2015). The pressure management techniques developed in the esports world could also have applications in military training. Professional esports players often employ various cognitive and psychological strategies to maintain performance under pressure, including mindfulness techniques, arousal reappraisal, cognitive reframing, and mindset exercises (Leis et al., 2024; Sharpe et al., 2024b). These techniques, adapted to military contexts, could potentially enhance personnel's ability to perform under the extreme pressure of combat or other high-pressure situations.

The use of game-based learning and simulation, already employed to some extent in military training, could be further enhanced by incorporating elements from esports. The immersive and engaging nature of esports-style games could be leveraged to create more effective training simulations for a variety of military scenarios. For example, virtual reality (VR) technology, which is increasingly used in military training, offers a promising avenue for creating realistic, low-risk training environments that can help personnel enhance and practice critical skills (Ahir et al., 2020). However, it's important to note that while there are many potential applications for esports-derived knowledge in military contexts, there are also significant limitations and challenges to consider. The transfer of skills from gaming environments to real-world military situations is not always straightforward, and the effectiveness of such transfer would need to be rigorously tested and validated. As critical scholars have noted, any apparent similarities between gaming and military contexts are not coincidental but reflect their shared historical, technological, and institutional connections (Elam & Taylor, 2022; Stahl, 2010). Moreover, the psychological impact of using game-like interfaces for high-stakes military applications, such as drone warfare, raises ethical concerns that would need to be carefully addressed.

Next Steps

As both fields continue to evolve, the potential for cross-domain knowledge transfer is likely to increase. Future research should focus on identifying specific skills and cognitive processes that effectively transfer from esports to military contexts, developing targeted training programs that leverage these identified skills, and assessing the long-term impact of such

training on military performance and readiness. A strategic initial step would be to identify individuals and scenarios where skill translation would yield the most significant benefits. For example, this could involve focusing on video display unit operators or personnel using dismounted situational awareness systems. This targeted approach would allow for the implementation and assessment of interventions using rigorous and transparent research methodologies, enabling clear, evidence-based recommendations. Furthermore, establishing focused research priorities would help shape future collaborative efforts between the military and esports sectors. These priorities could include improving task-switching abilities or developing novel cognitive training approaches. Lastly, conducting comparative studies of cognitive abilities between military/responder trained individuals and esports players could provide valuable insights into specific capabilities that are particularly relevant to both domains, further informing the development of effective training programs and performance enhancement strategies.

Ethical Concerns

The increasing convergence of military operations and gaming technologies raises significant ethical considerations that warrant careful examination. The gamification of military training through esports-based simulations, while potentially effective for skill development, risks trivializing the gravity of warfare and desensitizing personnel to the serious consequences of military actions (Coker, 2018; Krishnan, 2016). This ethical concern becomes particularly acute when considering how game-like interfaces used in remote warfare systems, such as drone operations, may create psychological distance between operators and the lethal consequences of their actions (Asaro, 2013; Chamayou, 2015). Conversely, the militarization of esports—through sponsorships, recruitment initiatives, and the promotion of military themes in competitive gaming—raises its own set of ethical questions. The U.S. Army's controversial esports team and Twitch channel, for instance, has faced criticism for targeting recruitment efforts at potentially vulnerable young audiences through gaming platforms (Gault, 2020; Vincent, 2020). Such initiatives blur the lines between entertainment and military recruitment in ways that may not allow for fully informed decision-making by young individuals. Additionally, there are broader societal implications to consider. The normalization of military themes in popular esports titles may contribute to what some scholars term the "militarization of society"—the increasing acceptance of military values, language, and approaches in civilian contexts (Der Derian, 2009). This raises questions about how the gamification of warfare might influence public perception and support for military operations.

From a research ethics perspective, studies examining skill transfer between esports and military contexts must carefully consider the potential dual-use nature of their findings.

Research intended to improve training effectiveness or cognitive performance could potentially be applied in ways that facilitate harmful applications of military power (Marchant & Allenby, 2017). Addressing these ethical concerns requires multidisciplinary collaboration between game developers, military organizations, ethicists, and policymakers. Transparent frameworks for the ethical development and implementation of esports-based military training, clear guidelines for military recruitment in gaming spaces, and ongoing critical examination of the militarization of gaming culture are all essential components of a responsible approach to this emerging intersection of domains (Robinson et al., 2012).

Conclusion

We highlight the potential for transferring esports research to military and emergency service settings, particularly in areas requiring rapid decision-making, strategic thinking, and performance under pressure. Esports-based training could enhance cognitive skills, team coordination, and pressure resilience in military personnel. However, despite the promising parallels, it's essential to validate these methods through rigorous and transparent research and address ethical concerns about gamifying military training. Additionally, future research must address the cultural dimensions of esports, including demographic considerations, regional variations, and the historical connections between gaming and military technologies. As technology evolves, the connection between gaming and military practices may offer innovative strategies for training and performance in high-stakes environments.

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