

Exploring electronic sports: An interdisciplinary approach

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INTRODUCTION

Electronic Sports, or “esports,” refers to high-level play and spectating of digital video-games (Hamilton, 2012), and typically involves a team of players. These players perform at the peak level of performance in these games- making reflexive and precise hand-movements, taking in and responding to large amounts of information, and work effectively with their team. The large similarities that this form of competition has with traditional sport has lead the U.S. government to begin assigning P-1A athletic visas to competitors. This field has grown drastically over the last decade- more competitions and players are participating and events attract millions of worldwide online spectators. In this panel we will discuss current research involving these players in the fields of human-computer interaction, team dynamics, cognition, information processing, as well as the potential applications in other subfields. The panelists have both direct research and professional experience with electronic sports: Cyrus Foroughi will provide insight as a former professional-gamer, James Kozachuk has run multiple nationwide tournaments for college and high school students, and Dr. Guo Freeman has a robust background in studying social dynamics in multiplayer online games, and is using that knowledge to inform electronic sports research. This discussion panel will consist of ten-minute introductions by each of the panelists regarding their current relevant research and professional backgrounds, and will conclude the remainder with an open discussion panel. This panel hopes to explore questions such as:

- With the large reach of these competitive games for both players and spectators, why are there few psychological studies directly looking into the phenomenon of electronic sports?
- How can researchers recruit individuals for studies on electronic sports? What are the barriers to this research?
- In what ways can electronic sports-related research be conducted in the field of human factors psychology?
- How can research benefit the experience of esports players and spectators?
- What is the role of the spectator in esports? How can human factors better serve this demographic?
- What can we learn about other disciplines, such as traditional sports, through electronic sports research?
- Are the similarities between electronic sports and traditional sports similar enough to warrant future studies?

PANELISTS

How, if at all, does Playing Video Games Affect Attention and Cognition?

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The rise in competitive esports and more generally in the amount of time that individuals spend playing video games has led researchers to begin to explore the above question. As human factors practitioners, we should investigate how humans interact with these technologies (i.e., video games), and whether those interactions affect attention and cognition.

Previous Research (Video Game Play). The seminal work by Green and Bavelier (2003) in *Nature* showed that individuals who self-report as playing video games have heightened attentional abilities. In studies 1-4, they showed that video game players (VGP) had better performance compared to non-video game players (nVGP) on a battery of tasks including the flanker, enumeration, useful-field-of-view, and attentional-blink tasks. These studies were supported by a 5th training study that showed that nVGP who played action video games had increased visual selective attention compared to controls, supporting a causal mechanism. Since then, many cross-sectional and training studies have supported their work (e.g., Cain, Landau, & Shimamura, 2012; Castel et al., 2004; Green & Bavelier, 2006; Green & Bavelier, 2007). However, many studies have failed to replicate these findings. Specifically, Boot and colleagues (2008) failed to replicate the findings of Green and Bavelier (2003) with a similar training study, and many studies have not replicated the cross-sectional findings (e.g., Irons, Remington, & McLean, 2001; Murphy & Spencer, 2009). Further, Boot, Blakely, & Simons (2011) pointed out methodological flaws in many previous studies and other possible explanations that could explain the previous findings. In sum, there is mixed evidence to support the claim that playing video games enhances attentional abilities.

Esports. Although researcher have begun to explore how playing video games may affect attention and cognition, little research exists that has examined how playing esports affects attention and cognition. Arguably, there are many similarities, but some differences are likely to exist. Most individuals who play/compete in esports likely represent the extreme end of individuals who play video games in terms of the amount of time played and the level of skill in the game. Thus, the obvious question is a classic “chicken or egg” question: how does one become an elite esports player? Taking Ericsson’s (Ericsson, Krampe, & Tesch-Römer, 1993) approach, does it require countless hours of deliberate practice to become elite? Or do innate abilities such as a predisposition of improved reaction time come into play? Or, and this is the most likely scenario, what combination of both is required?

Assessing Esports Players. One important consideration is the feasibility of measuring the attentional and cognitive abilities of the elite esports players, in this case, professional video game players. This would provide a ceiling for which other data can be compared across video game domains. It is not easy recruiting professional gamers for research. These players travel often and dedicate large portions of their day to practicing. Contacting them can be difficult and attempting to find a time when they can complete an on-site experiment is nearly impossible. Fortunately, as a former professional gamer, I was able to reach out to a few of my friends, and gain access to some current professional action video game players for experiments. Thus, combining my former experience in gaming with my formal training in experimental research, I have started to bridge a gap in this area of research. Further, being someone that these players can relate with made our interactions very positive. Unsurprisingly, early data from our lab indicates that elite esports players (i.e., professional video game players) have attentional abilities that are “off the charts” with very low reaction times and excellent performance on many attentional tasks (e.g., flanker, SART). However, as this data is not final and as correlational does not mean causation, we caution our findings for the time being.

How, if at all, does Esports Shape Players’ Online and Offline Social/Interpersonal Relationships?

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In the field of CSCW (Computer-Supported Cooperative Work) and HCI (Human-Computer Interaction), digital games have been considered an effective way to incorporate “warmth, playfulness, and poeticism” (Strong & Gaver, 1996) as powerful complements to design and develop any collaborative systems (Freeman, Bardzell, & Bardzell, 2016). There is already a large body of CSCW and HCI literature on social dynamics in gameplay (e.g., Brown & Bell, 2004; Ducheneaut, Moore, & Nickell, 2007; Ducheneaut & Moore, 2004; Freeman et al., 2015; McEwan et al., 2012). However, esports, as a new form of social gameplay intertwined with sports, collaboration, competition, cohesion, comradeship, blurred boundaries between online and offline social interactions, as well as game culture itself, has received relatively little research attention. The juxtaposition of the social meanings of competitive sports with the implementation of teamwork and collaboration as a game mechanic raises interesting questions about how studying social dynamics in esports can contribute to better designing games for social support and social learning. There is a growing body of scientific research on esports. For example, using interviews and ethnography, Taylor (2012) thoroughly investigates the connection between esports and sports, the path from amateur gaming to professional gaming, the structure and culture of esports, as well as gender issues in the traditionally male-dominated gaming world. By definition, esports is playing competitive games according to generally accepted rules of leagues and tournaments on the Internet (Weiss, 2008). On the one hand, esports are sophisticated Internet applications. Games such as FIFA video game series, Counterstrike (CS), Dota 2, and

League of Legends (LoL) rely on advanced networking technologies to facilitate real-time inter-player interaction and competition. On the other hand, esports are highly complex sociotechnical systems. Players usually form small teams (e.g., “clubs”) to compete with other teams. In order to win in such highly competitive virtual environments, esports players extremely emphasize the sense of community, belongingness, cohesion, and comradeship among them. In contrast to regular multiplayer games in which players are physically distant and rarely meet one another offline, esports involve simultaneous watching gameplay on streaming websites (e.g., Twitch) and meeting others regularly at offline tournaments hosted by providers such as the League of Legends Tournament, the Electronic Sports League (ESL), and the National Gaming League. In all of these ways, esports in fact require and foster high level social skills (e.g., interaction, communication, cooperation, negotiation, and management) rather than undermining such skills. Then, the question becomes: How, if at all, do esports shape players’ social lives and interpersonal relationships, both online and offline? To explore this question, this research brings different perspectives and research methods to this topic. Specifically, this research has two contributions: First, it focuses on esports players’ social experiences and interpersonal relationships. This includes a scientific investigation of collaborative/competitive dynamics within the esports community and sheds light on the explicit and/or implicit impacts of esports on players’ collaborative learning and sociability. Second, by exploring when and how esports players feel enjoyment and emotional satisfaction in the interplay between game-mediated competition and collaboration, it endeavors to design and develop games for online social support. This points to future directions for designing value-sensitive and socially oriented games (Flanagan et al., 2005; Friedman, 1996) in contrast to the stereotype of revenue-oriented digital gaming industry. Both online and offline data will be collected for this research. The first type of data will be esports players’ self-reported data (i.e., posts and threads) of their gameplay and social experiences collected from popular online public forums for esports and public Facebook pages for esports teams. The second type of data source will be interview data. Esports players or people who engage in the esports community will be recruited to participate in semi-structured interviews. An in-depth qualitative analysis will be used to code and interpret the data, in order to explore participants’ unique and subjective personal experiences of esports and the rich sociocultural context surrounding their gameplay activities. At last, players’ in-game behaviors and go to public events/social gatherings/offline tournaments for esports will be observed to investigate their social interactions both online and offline. One insight from this project would be a better understanding of how coordination and collaboration in highly competitive gaming worlds can build players’ motivations and confidence to engage in self-improvement and a number of social activities. These findings will lead to future research on designing digital games that better combines competitive and collaborative dynamics for effective social learning.

How, if at all, Can Students Benefit from Structured Competitive Play?

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There is a strong link between participation in structured after-school activities and increased academic achievement among high school students, while engagement in solo activities such as Television Watching has been found to decrease performance in school (Cooper, Valentine, Nye, & Lindsay, 1999). However, much of this research was conducted on sports teams and other structured groups (e.g. church groups) leaving a critical gap of assessing the impact of team-based competition separate from traditional sports. With video-games as such a mainstream source of entertainment for youth, playing these games at a competitive level with friends has begun to follow a similar trend. Electronic sports, or “esports,” refers to competitive video-game play, often played in organized teams. The aim of this research was to better understand what role, if any, organized competitive video-game play has on school performance and to perform an assessment of their suitability as a beneficial after-school activity. Previously, competitive video games have been criticized for increasing feelings of aggression and decreased academic achievement (Gentile, Lynch, Linder, & Walsh, 2004). While much of this research has been criticized (Ferguson, 2007) and esports are becoming an increasingly popular activity for young adults (Hollist, 2015), a dearth of studies are left in their place indicating addressing this research questions is a critical need in both the game and teamwork fields. The current research sought to assess this critical issue by measuring factors that influence team cohesion and academic performance among high school esports teams who play competitive video-games in a varsity circuit and how this play impacted individuals’ team cohesion at the time of play and the specific factors that influence academic performance of esports team members. Five-hundred (500) students participating in an online varsity video-game league, upon completion of a 12-week competition, were surveyed about their high school team experiences. A structural equation model was built to determine the factors that influence team cohesion, motivation to play, and academic achievement within the esports players. As hypothesized, the amount of structure of the esports club was a moderate predictor of ($\beta = .14, p < .05$) academic performance (GPA, Number and percentage of honors classes taken) and the cohesiveness of the team ($\beta = .16, p < .05$). Additionally, self-reports of team performance were also associated with increased cohesiveness ($\beta = .32, p < .01$), but not motivation to play or academic performance. Amount of video-game play was associated with decreased academic performance ($\beta = -.15, p < .05$), indicating that it is participation in the esports team not video game play that drives increased cohesion and academic performance. Additionally, we found another indirect effect of team cohesion on academic performance as teams that were more cohesive had members who were more intrinsically motivated to play ($\beta = .56, p < .001$) which lead to further increased academic achievement ($\beta = .11, p < .05$). The practical implications of this finding could be generalized to the realm of educa-

tion. Providing a suitable outlet for students to socialize and interact with a community of peers similar to themselves would allow positive academic and social benefits to students. An example of this would be the inception of an esports team at Robert Morris University in Chicago, Illinois. With university investment, Robert Morris University created a high quality team experience for their students, resulting in large performance benefits: reaching high placements in numerous collegiate varsity tournaments in 2014 and 2015. High school such as Guilford High School in Rockford, Illinois, have also adopted similar programs that have been well received by administration, students, and parents. Industry involvement has begun to grow: a good example of this is acquisition of collegiate community organizer, “Tespa,” by Blizzard Entertainment in 2013. This new partnership brings structured community environments to students. Through our research, we hypothesize this kind of environment is bound to produce similar academic benefits demonstrated by the high school students without our sample. Through dissemination of this research to teachers, educators, and school-board members we have better informed potential relevant stakeholders to this positive academic experience, who in turn have begun to take action to help reduce the archaic resistance to allowing these clubs on their campuses. This leaves an opportunity for companies to help further advance the structure of these clubs through other supporting partnerships, such as easing the monetary cost of these high quality experiences through product sponsorships, interactivity with these students, or other quality program-building processes. One might ask why industry has been reluctant to invest in these teams: a misconception about the gaming community may be the answer. There is the common stereotype that avid video game players are seen as addicted which leads to further perpetuating the negative connotation that video game players are “low-class, proto-violent addicted and dangerous kids” (Beavis, 1998). This is due to the idea that game playing is addictive, which thus produces a particular form of gamer (Cover, 2006). This has had many implications on industry and development in the gaming world. This also leads to the question of the legitimacy of gamers and their authenticity as members of a broad community. There are opportunities to take this research even further: within the literature there are additional benefits which have not been addressed in the present sample. These potential benefits include an increase in prosocial behavior (Kataoka & Vandell, 2013). Further research is currently being conducted within this domain, and we hope to better understand the importance of these high quality socialization experiences and their benefits to students. Through dissemination of this research to teachers, educators, and school-board members we have better informed potential relevant stakeholders to this positive academic experience, who in turn have begun to take action to help reduce the archaic resistance to allowing these clubs on their campuses.

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