It is of critical importance that media scholars extend their scope for understanding the ambiguous state of the relationship between Quality of Service (QoS) and Quality of Experience (QoE) for online multiplayer gaming. Dark Play can be defined as transgressive play to intended gameplay, it has a myriad of forms, it is ever-present in games, and can radically alter the player's perceptions and evaluation on quality of experience for a game. The QoE for digital games becomes a reflection of both QoS, and the presence and impact of dark play. To date, scholarship in game studies, media studies and computer science has neither provided rigourous investigation of the dynamic relationship between dark play and QoS, nor provided a stopgap to constitute an adequate understanding in the interim. It would be fair to state that the relationship has not been properly investigated at all.

My doctoral research takes up the challenge of investigating the impact of dark play on quality of experience. My goals are two-fold: *to explicate the central role* that dark play plays in determining a player's quality of experience; and *to address an epistemological gap* in game studies (and media studies in general) for the understanding of the dynamic relationship between QoS and dark play.

Quality of service can be quantitatively-determined through dependable methods however a variety of dark play forms can directly disrupt the quality of service in such a way that players may be confounded as to the causes of a poor gaming experience. A player may evaluate game experience as poor through ascribing the quality of experience to quality of service when, in fact, the quality of experience is heavily-impacted by the presence of dark play. Gears of War 2 (Epic Games, 2008), is exceptional for providing gameplay experiences riddled with a variety of dark play which affects QoS and QoE. The games of the incredibly popular and successful Gears of War series (2006-16) provide an appropriate starting-point for analyzing the relationship between dark play and QoE, especially with respect to accounting for the player's ability to properly distinguish QoS factors and dark play factors that determine QoE.

CONTEXT: Existing scholarship has sought to define models for multimedia QoS categories from an end-user viewpoint through quantitatively analysis of QoS. The limitations to this research are not in the quantitative methods of analysis for how networks, services and applications operate, but instead in how the user manages and makes sense of the service. The International Telecommunication Union (ITU) recognizes interactive games as being in the category which is the least tolerant of information loss and delay among digital media forms. From an approach focused on QoS, the popularity of online multiplayer games demands an investigation as to how client-server based network architecture handle massive amounts of network packets (Kim et. al., 2007). The conclusion of some studies (Fiedler et. al., 2010), might suggest that particular forms of dark play can exacerbate an already low QoE in an exponential way. An additional problem noted by Sat & Wah (2009) is that adapting to poor QoS can be culturally-specific, which may also apply to adaptations with different forms of dark play. Consalvo (2008) notes that certain forms of dark play can create communication difficulties, with an end-result that would adversely affect QoE in online multiplayer games. The relationship of QoS and dark play in determining QoE is yet unexplored through academic-based research.

RESEARCH QUESTIONS:

1) What service delivery and service limitations afford different forms of dark play in online multiplayer gaming?
2) What forms of dark play impact quality of service, and how? What is the nature of the relationship?
3) What forms of dark play impact quality of experience, and how? What is the nature of the relationship?
4) Where do players misperceive, misrecognize and misinterpret QoS in online multiplayer games, especially with respect to the presence of different forms of dark play?

5) What methods of adaptation do players implement to address perceived disturbances in QoS or disturbances perceived as emerging from dark play?

METHODOLOGY: A holistic theory of dark play will help to guide ethnographic study. Interviews will provide insight for how players make sense of different forms of dark play and quality of service disturbance. Experimentation should involve groups of players that will have several game sessions with Gears of War games. A game catalog would be assembled to determine which Gears of War games, game modes, and maps are to be used, along with a rationale for those selections. Testbed engineering would be structured for game sessions that would be run on a local area network (LAN) in order to control for lag/latency. Session types would introduce a baseline, intentionally generate lag (latency) to gauge how players qualify QoE relative to critical disturbances of QoS, intentionally implement dark play to gauge how the players of opposing groups qualify QoE relative to dark play, and then combine lag and dark play. Different forms of dark play would be used and alternated, especially those often mistaken as emerging from poor service delivery or service limitations. Players would be interviewed during and after game sessions to gauge their response to varying game states, and to measure a QoE using MOS (Mean Opinion Score) methods. The data would be analyzed, theoretical models refined, and conclusions published which encourage nuanced re-testing and stimulate further study.

STATUS: I am currently in my second year in the PhD in Communication program at Concordia University. My supervisor is Dr. Mia Consalvo, who is Canada Research Chair in Game Studies and Design, a leading scholar in the international game studies community, and a foremost theorist of dark play in gaming. I completed my doctoral exams in September, 2017. I have researched dark play and Gears of War in my Masters work at the University of Toronto, supervised by Dr. Jennifer Jenson of York University (President of the Canadian Game Studies Association). My ethics protocol for research with human subjects will be submitted in 2017. My theoretical-based work on dark play was a major part of my doctoral exams.

IMPACT: This project aims to make visible key elements of the relationship between quality of experience and dark play in gaming, distinguishing the conditions for misinterpretation of dark play disturbances **as** quality of service limitations, and vice-versa. Explicating these relationships will provide government agencies and oversight entities, such as the ITU, with qualitative research that clarifies parameters for quality of experience thus making it more straightforward to standardize quality of service for gaming worldwide. Additionally, the consumer and game industry may find that this qualitative research enhances the perceptions of QoS and dark play in a manner which facilitates more sophisticated forms of adaptation for game development, game production and gameplay. Dark play can disturb the flow of communication in such a way that players may experience social ostracism, alienation, and marginalization. The perception of a low quality of experience arising from the complex relationship of dark play and QoS may contribute to the formation of toxic game communities.

Advancing research through this project will address important social and economic issues that matter to Canadians, adding to their understanding and knowledge about how games work, how networks operate, how Canadians think as game players, and how we interact and communicate in game communities as well as on the world stage in the global game community. Canada is deeply invested in the game industry (third-largest game industry in the world, and growing) and research into games must provide deep inquiry to match this commitment. Funds from SSHRC will enable me to positively contribute to both the academic and gamer communities by facilitating travel to conferences such as those held by the Canadian Game Studies Association and the Digital Game Research Association.

The expected timeframe for completion of this research is three years.