

*Examining the Relationship between Trait Emotional Intelligence and Playstyles
within an MMO*

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Submitted to the National College of Ireland, April 2016

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Acknowledgements

I would like to sincerely thank my supervisor, Rebecca Maguire, for all her guidance, support and most of all, her patience; not only with this thesis, but throughout the last three years. I would also like to especially thank Philip Hyland and Arlene Egan for their help, support and critical insights during my time at NCI.

Finally I would like to thank my family, for their support and to Pluto for giving me the inspiration I needed.

Abstract

Purpose: This study aims to determine if a relationship exists between Trait Emotional Intelligence (TEI) and MMO Gamers playstyles within the game Eve Online.

Background: Levels of social interaction was chosen as the primary playstyle to examine, as previous studies have shown social factors being the primary motivation behind many MMO players as well as being the defining characteristic of the MMO genre. Griefing was chosen as a secondary playstyle to examine as it's a common form of anti-social behaviour online, that lacks sufficient understanding.

Methods: The sample consists of 252 players of the Eve Online Massively Multiplayer Online Game; 98% Male, 2% female with a mean age of 27, all of which were recruited online, through forums and directly in-game. Playstyles were defined by levels of social interaction within the game's context; those who primarily played solo, in small groups, large groups, or Alliances (A collection of large groups) .For griefing, a simple self report likert scale was used to assess levels of greifing. A series of ANOVA's were run to determine if any statistically significant differences existed between these groups

Result: Results showed no significant differences in TEI scores between levels of social interaction, though griefing showed a non-linear relationship with significant differences in the sociability and well-being subscales of TEI.

Submission of Thesis and Dissertation

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Introduction

The following study is an examination of Trait Emotional Intelligence (TEI) in Online gaming, specifically the Massively Multiplayer Online Role Playing Game (MMORPG) *Eve Online*. This game was selected for its unique technological and social nature within a vast virtual world. It's technological rarity being a Massively Multiplayer Online Game (MMO) with a continuous shared history and its inherent social hierarchy in the game's structure being beneficial to the design of the study. Both of these aspects will be further explored further on. In the context of gaming, a virtual world is a multi-dimensional space in a digital environment within which players can interact with each other or the world itself (Chesney *et al*, 2009). Emotional Intelligence is an area of research that has seen much use in the workplace, and has enjoyed a degree of success in predicting job satisfaction and performance. TEI especially has found evidence of emotional skillsets that may benefit people's interpersonal relationships (Goleman, 1998; Petrides, Siegling, & Saklofske, 2011). This makes it the ideal tool to explore whether MMO's have any positive or negative relationships with TEI scores. To begin, let's examine MMO's.

Massively Multiplayer Online Games

For the sake of clarity, let's explore the nature of MMO's and their unique features. *Eve Online* is an MMORPG, which is a genre that belongs to the larger subset of Massively Multiplayer Online games, these are online games that are typically much larger in scope and playerbase than general online games. They involve servers that remain online, near constantly with large numbers of players connected. *Eve Online* has the largest single server, with a record of 65, 303 concurrently connected players (CCP, 2013). MMORPG's are simply MMO's with an emphasis on role-playing elements, like character progression, learning skills or acquiring possessions; all within the virtual world. What MMO's provide is a degree of permanence within the virtual game world whereas typical online games are short, isolated instances, akin to rounds in a sports game (Burn & Cook, 2006; Yee, 2014). This degree of permanence gives players

incentive to build lasting connections to this shared virtual space, in the form of conquering areas, or simply building social networks. This is why MMORPG's are the predominant genre within MMO's, they are well suited to the concept of role-play with the persistent virtual world allowing them a degree of progression. Though as time goes on, many online games are beginning to implement MMO features and the distinction between MMO games and regular online Games grows weaker. A very popular and prominent example being the latest Grand Theft Auto game, which has begun to incorporate many online role-playing elements and persistent features into its online multiplayer (Bank accounts, owning property etc). This trend may continue as virtual worlds become more commonplace and MMO features creep into other aspects of digital media. This leads us into why this is an important area of cyber-psychological research. As more games and media gravitate toward a persistent online experience, we should examine why gaming in general is such a huge area of cultural significance and worthy of scientific examination (Castranova, 2005).

Gaming

In the last few decades digital gaming has grown to become a multi-billion euro industry; in the US alone it has grown from ten billion dollars revenue in 2007 to over twenty four billion in 2015, while globally it's been estimated to have reached over ninety billion dollars in 2015. It is set to exceed one hundred billion within 2016, with China overtaking America as the largest market share. For comparison, the global box office income for the film industry in 2015 was thirty nine billion US dollars. Which makes digital gaming, the largest, and fastest growing form of digital entertainment, economically speaking (ESA, 2015). This has serious cultural implications, not only are digital games extremely prevalent in modern society, but gaming itself has emerged as a huge driving force behind the technology of our modern lives. The Gaming industry has had a profound impact on technological growth in recent years, with the economic benefits creating a demand for faster computer processors and more powerful graphical fidelity, not simply on modern desktop computers but on game consoles, phones, tablets and other devices. In fact, the industry may largely be responsible for the very existence of these powerful

handheld devices. Gaming has, to a large degree dictated the direction of modern computer development (Yee, 2014). As the president of the Entertainment Software Association of America (ESA), Michael Gallagher states

“Games are ingrained in our culture. Driven by some of the most innovative minds in the tech sector, our industry’s unprecedented leaps in software and hardware engages and inspires our diverse global audience. Our artists and creators continue to push the entertainment envelope” (ESA, 2015, p. 2).

Because of this deep cultural significance and impact, it’s no surprise psychological issues surrounding gaming have begun to become more widespread. Currently the Diagnostic and Statistical Manual of Mental Disorders (DSM) does not recognize digital gaming addiction as a disorder, but has classified Internet Gaming Addiction as a potential inclusion (Petry *et al*, 2014), along with internet addiction, now more commonly referred to as Problematic Internet Use (PIU). Both disorders are thought to be psychological dependencies, defined by a pathological abuse of internet, or internet based services to the point it drastically interferes with an individual's quality of life (Shapira *et al*, 2000; Mehroof & Griffiths, 2010). In Kim *et al*'s, 2006 study of Internet Addiction rates in a Korean sample, they found that 1.8% of subjects had the disorder, and 38% were at serious risk of developing it. It also found that those with the disorder were at a higher risk of suicide, though the exact nature of the correlation is undetermined, it's still clear PIU is an indicator of serious psychological distress. While Weinstein & Lejoyeux's, 2006 meta analysis of European and American samples estimated a prevalence rate of between 1.4% and 8%, which indicates this trend is not an isolated instance but is prevalent across cultures. This shows the need for more intervention and understanding of emerging psychological risks associated with this unprecedented technological growth. Especially as some governments are trying to limit access to certain MMO's to avoid the negative social consequences of these types of addictions (Young, 2009; Young, 2007).

An interesting statistic to note is that the average online gamer spends up to twenty one hours a week gaming, this is interesting as Nielsen statistics have shown that the average American watches twenty eight hours of television a week, and the average online gamer only spends around seven hours a week watching television (Neilson, 2014; Yee, 2009), this overlap suggests a cultural shift from the more traditional form of media, such as television to the new medium of gaming. Many studies on addiction may overemphasize the amount of time players spend online while ignoring this cultural shift in entertainment. As media has long been a large part of many peoples lives, gaming simply represents the most current form. Thus a more comprehensive understanding of the nature of gaming can only help identify issues of addiction.

The Daedalus Project was a long running survey of MMO players run by Cyberpsychology pioneer, Nick Yee (Yee, n.d.). The project provided a huge amount of demographic information and playstyles of the average MMO player across several games and genres (Though mainly the World of Warcraft MMO). Nick Yee's work also provided great insights into the motivations behind online gaming, his analytical model for motivations of play (Yee, 2006a) found players playstyles could be used to identify key areas of motivation. The ten components found could be reduced to three key areas of motivation; Achievement, Immersion and Social. Achievement based play would be a player highly motivated by achieving goals within the world, whether those goals are set by the game or by their own ambitions. Immersion based play has to do with the role-playing elements of MMO gaming, escapism being an indicator of a person who likes to be immersed in a virtual world. Social based play would be someone motivated by maintaining or developing social relationships within the game.

While the current study is primarily interested in the social aspects, it's important to note that Achievement based playstyles can also be intrinsically linked to social factors within the virtual environment. For example, one of the players Yee interviewed, described his motivation to play as “ trying to establish a working corporation within the economic boundaries of the virtual world” (Yee, 2006a; p. 722). As a reason to play, this achievement can only be achieved through social means, a corporation being a community of players within *Eve Online* (Often

referred to as Guilds within other Online games). This also shows playstyles within a virtual world as a viable area of research and as a predictor of behaviours. We will be examining playstyles largely in regards to sociability, but it is important to keep player motivation in mind at all times, as the players motivation is the drive behind all of their behaviours and interactions in the virtual world (Yee, 2006b).

MMO's provide more pro-social benefits than games of a different genre, as Brack *et al's* (2013) study showed, they were able to identify social skills gained by players using Alderlin personality theory. Alfred Adler developed individual psychology as an alternative to Freudian psychoanalysis with its sexual focus. Instead Adler focused on how people interpreted their own world, a useful approach in a virtual environment such as MMO's. Individual Psychology is now primarily used as a form of therapy, or psychotherapeutic approach to education, mental health care or consultancy (Ansbacher & Ansbacher, 1956; Watkins, 1984). Fong & Foster (2009) found that participation in online communities bolstered players Personal Sense Of Community (PSOC), a construct that has been shown to have a beneficial relationship with well being, self-esteem and cognitive resilience. These studies suggest there are some benefits to engaging in online worlds and yet there is a distinct lack of research into the benefits of MMO games. There is a prevailing bias for examining the negative aspects such as addiction or problem gaming. This is why the current study aims to examine TEI in relation to MMO playstyles. If there are pro-social benefits then players involved in heavily socialized playstyles should display different TEI levels or traits. If a significant difference is present, then participation in these social groups may be having an effect on TEI, only closer examination can tell.

Emotional Intelligence

Daniel Goleman originally defined Emotional Intelligence (hereafter known as EI) as; the ability to recognize and manage the emotions of yourself and those around you. His work primarily focused on EI in our everyday lives and in the workplace. He heavily promoted its ability to predict levels of job performance more accurately than IQ or job experience (Goleman,

1995; Goleman, 1998). Though Goleman popularized the concept, its roots can be traced back to Thorndike's (1920) theories of social intelligence, which Thorndike described as an ability to understand and manage interpersonal relationships with people. EI is a modern interpretation of very old concepts and emotional skillsets (Petrides, Siegling, & Saklofske, 2011). Since Goleman's original conception of EI, research has identified two distinct areas of EI. Trait Emotional Intelligence (TEI) and Ability Emotional Intelligence (AEI), with Goleman's original concept being seen as a combination of both. Ability EI theory treats EI as a collection of cognitive abilities which are related to emotional skills (Mayer, Salovey & Caruso, 2004), whereas Trait EI is a self reported personality construct relating to an individual's perception of their emotion related skills (Petrides, Furnham & Mavrveli, 2007). Ability EI is treated more like a conventional intelligence and is measured as such by a series of problem-solving items. This approach has been criticized for not being objectively valid enough to provide reasonably consistent results, nor is it capable of the predictive strength of either Goleman's model or Trait EI (Bradberry & Su, 2006). Consequently, TEI is more suited to the needs of our study, and has more reliable predictive power. The variables of importance in the study, revolve around social interactions; such as, how socially involved a player is in their virtual environment and how they treat others in this environment. As EI was originally developed for use in the workplace, it may also be useful in this virtual environment for determining personality related social skills. It also provides four sub-scales for assessing individual abilities, sociability, emotionality, self control and well being. These will be explored further within the measures section.

Griefing

Griefing is a term used in gaming vernacular to describe inappropriate anti-social behaviour, though the specific nature of the behaviour is up for debate. Many feel that any action that causes emotional distress to a player is an act of griefing while others would argue causing emotional distress in a competitive environment is intrinsic to their experience (Bakioglu, 2009; Rubin & Camm, 2013). In competitive sport, there are clear guidelines on how players should act, fouls are enforced if rules are broken. But in a complex virtual environment enforcing player

actions would inhibit the gaming and role playing aspects, both of which we know from Nick Yee's work to be massively important motivations behind MMO players. Thus each gaming community tends to develop their own socially acceptable behaviours within their own context (Warner & Raiter, 2005). A common example is the activity known as ninja looting, which is to loot (take items from) an area or corpse after someone else has performed the work of clearing or killing enemies in the area (Achterbosch, Miller & Vamplew, 2013). In Achterbosch, Miller & Vamplew's examination of this behaviour, they were interested in taking a closer examination of griefing as previous research in the field may have erroneously classified competitive behaviour as griefing behaviour. They found that those who self-identified as griefers were more likely to see this behaviour as an acceptable way to earn income, while others saw it merely as a form of stealing, designed to elicit a negative response from so-called victims. Though it is no surprise that the perpetrators have different perceptions than victims of such behaviours, it's interesting to note the extreme dichotomy of responses. Both sides are naturally inclined to be biased, and researchers should be aware of the perceptions of the players as it may distort their interpretation of in-game events.

Though griefing can be a grey area, there is certainly evidence of players who engage in extreme cases of anti-social behaviour (scams, cheating, harassment) with the sole purpose of eliciting strong emotional responses for their own amusement (Adrian, 2010; Bakioglu, 2009). The difference between those who simply prefer to play anti-social roles within the game world, and those who actively seek to cause emotional distress, lies in the motivation behind their behaviour, rather than the behaviour itself. Achterbosch *et al's* (2014) study used Nick Yee's Motivation for play model (2006a) to examine the motivations behind those who grieve as well as those who have been grieved. They found significantly different patterns of motivation behind players who grieved versus those who have been grieved. One of the key findings was that griefers tend to have much more interest in achievement based play as well as competitive based play. This lends credibility to the idea that TEI scores may vary between levels of griefing, as these groups of players are distinct in significant ways. In either case, it's an area of research that

needs closer examination as more people are exposed to virtual environments, the likelihood of being either perpetrators or victims of griefing also increases.

Rationale and Hypotheses

MMO's are inherently social, it is their fundamental nature to be driven by player events; they're primarily a massive virtual sandbox where thousands of players can interact with others in a myriad of ways, either pro-socially (Co-operative behaviour) or anti-socially (Competitive, Player Versus Player behaviour). Eve online has a somewhat unique architecture, in that everything happens on a single persistent server. What this effectively means, is that all players engage in a constantly evolving shared history. Events from a distant battle involving hundreds of players, can potentially affect every other player on the server even if they weren't directly involved. For example, a large scale battle involving the destruction of hundreds of ships may influence the economy, driving up the price of that particular ship or the materials required to make it. Events like this are common in Eve, and they all add to the shared experience of the entire playerbase. The significance of this can't be overstated enough; most games exist as isolated instances, even most online games lack shared history in comparison to MMO's, there are no long-term consequences, social or otherwise, for any given event or outcome. Death or destruction rarely has meaning or significance in a first person shooter for example (Yee, 2014). When you have the potential for complex consequences with far reaching repercussions, the social interaction becomes the primary driving force of the game. This is what is unique to MMO's, and the research into player motivations suggests that this unique nature drives much of the players behaviour within the game. Does this unique aspect offer any psychological insights into the type of players, or their behaviours. If so then perhaps TEI can offer us a measure to explore this relationship within playstyles.

The main research aim of this study is to examine any possible link between TEI and MMO playstyles. TEI has already been used to great practical effect in workplace settings, and has been used in MMO research as well (Pérez, Petrides & Furnham, 2005; Herodotou,

Kambouri & Winters, 2011). Playstyles will be defined by levels of social activity within the game, using the inherent social hierarchy of the game to categorize them into solo players, small group players, medium group players and large group players. If player motivation for play varies depending on their playstyle and a link between TEI and MMO exists then we should see a difference in TEI scores.

Additionally the phenomenon of griefing will be examined in relation to TEI. Grieferers will be identified with a self reporting measure, as already mentioned there is some debate as to what constitutes griefing behaviour and no consensus on an all inclusive definition. As such it may be more useful to allow players to self identify as grieferers rather than trying to inaccurately test for it. As such, griefing will be treated as a playstyle. We know from the literature that grieferers motivations for play tend to differ, if their motivations and behaviours differ, then as a distinct group their TEI levels may vary and offer additional information.

Lastly, if either of these playstyles have a relationship with TEI scores, then the amount a person plays or the total length of time they have played, may also have a relationship with TEI scores; indicating MMO usage is having an effect on players TEI.

Thus, the following hypotheses are put forward.

Hypothesis no 1. TEI scores will differ between playstyles, as defined by levels of social interaction, and by level of griefing.

Hypothesis no 2. If active participation in playing MMO's has an effect on emotional intelligence then it should be vary by length of time played or by frequency of play.

Methodology

This section will cover the design of the study, the rationale for choosing this design, then followed by information on the participants, materials and measures used. Finally the procedure will outline the steps followed during the course of the study.

Design

A non-experimental quantitative between participants design was used for the study, there was no control group as there was a specific target sample required; Eve Online players. The variables of interest are, TEI scores (Of which there are five, detailed below); playstyles, of which there are two distinct types with different levels (levels of social interaction and levels of griefing); And lastly the variable of time, which is broken into average number of hours played per day, and total number of months playing the game. The materials and software involved was as follows. Google forms and Google sheets to collect and store participant responses respectively. While IBM's SPSS was used to perform the statistical analysis of the data. Access to the Eve Online MMO was also necessary to advertise on the official forum and to directly approach players within the game. The website Reddit was also used as a resource for recruitment.

Participants

The sample of this study was 252 *Eve Online* players, 98% were male, 2% female. Ages ranged from 18, to 60, with a mean of 27.06 and a standard deviation of 7.40. All were recruited online through a process defined in the procedure section.

Measures

The short-form Trait Emotional Intelligence Questionnaire (TEIQue-SF; Petrides, 2009) was used to measure EI. The questionnaire includes 30 items on a seven point likert scale, which gives one global TEI score (with a Cronbach's alpha of .89), it also includes four subscales which score individuals in different areas of TEI, as listed below. Each scale presents a score on a range of one to seven.

Well Being; A general sense of fulfilment in one's life, eg I do/do not find my life enjoyable (alpha of .85).

Sociability; Social related skills involving interpersonal relationships, eg I can effectively deal with people in my life (alpha of .67).

Self-Control; abilities to control one's thoughts and urges, eg I find it difficult to curb maladaptive behaviours (alpha of .60).

Emotionality; Emotion regulating skills and deep personal relationships eg I often struggle with my emotions in relationship settings (alpha of .85).

This scale has been shown to have both, reliability and predictive power (Mikolajczak *et al.*, 2007) and has been used in this area of research (MMO usage) before, Herodotou, Kambouri & Winters (2011) study used the TEIQue-SF scale to determine player's preferences for play in an MMO setting. The short-form was chosen over the longer form to keep the survey shorter for participants and because it had seen use in the relevant research already. Demographic questions were also asked, such as age and gender. As well as this, two time based questions were asked, based on Nick Yee's work in the Daedalus project. These included asking how many hours a day on average do they play (between zero to one hours a day, to over six hours), and the length of time they have played *Eve Online* for (from one month, to over nineteen). Both answers relied on

using Nick Yee's, and other relevant demographics in the area of research to come up with a baseline average (Yee, n.d.; Yee, 2009; ESA 2015; Herodotou, Kambouri & Winters, 2011). These time based questions may help understand player habits better and may also be linked to TEI if playstyles do indeed interact with TEI scores. Time spent in game may also have a connection to TEI.

For social playstyles, participants were simply asked which was their preferred primary playstyle.

Solo; Primarily like to play alone, and thus more independent.

Small Corp; Like to play with close friends, possibly ones known outside the game.

Large Corp; Larger corp with less personal ties to individual members and a larger emphasis on group dynamics.

Alliance; Playing within a very large group of players (from hundreds, up to several thousand) with a heavy focus on advancing towards long term Alliance goals.

The inherent structure of the game (Corps and Alliances) helped naturally group players by levels of social interaction and thus this question was tailored to group playstyles within this natural setting of the game.

The last question was a self report of griefing activity on a likert scale from one to five. Rather than defining griefing for participants, the question was left open ended, as "how often do you feel you engage in griefing behaviour". The rationale behind this was the open ended nature of griefing, as previously stated, there is no general consensus in the literature that can definitively differentiate griefing behaviour from a legitimate playstyle. Thus a self report may be a more conservative but accurate estimation.

Procedure

Data was collected through use of an online survey using Google Forms. This form was advertised on the game's official forum and the most popular Eve Online related subreddit which is another type of forum frequented by the playerbase. As well as this, players were directly approached in game to participant. All participants were directed to a brief explanation of the study and its purpose, and given the chance to enter an optional raffle where an in-game prize was offered as incentive. The form was left open for one week of data collection before being closed; afterwards a winner was randomly chosen. For ethical considerations participants under 18 were excluded, no personally identifying questions were asked to maintain anonymity. In-game names or account names were not necessary, and entering an email address was an entirely optional field. All emails were removed as soon as data collection was finished. Personal privacy was the biggest ethical concern and all steps were made to maintain anonymity. Participants also received a brief explanation of the study so as not to be surprised by the personal nature of the emotional intelligence questions.

Results

Descriptive Statistics

Tables 1 & 2 show the breakdown of playstyles including social interaction and frequency of griefing behaviour respectively.

Table 1: Levels of Social Interaction

	Frequency	Percent
Solo	69	27.4
Small Group	92	36.5
Large Group	37	14.7
Very Large Group	54	21.4

Table 2: Frequency of Griefing (1; never, 5; frequently)

	Frequency	Percent
1	94	37.3
2	74	29.4
3	51	20.2
4	16	6.3
5	17	6.7

In terms of frequency of play, 50% of players played between 1 to 3 hours a day, with 18.7% playing between 3 - 4 hours a day, 9.5% playing 4 - 5 hours, 6.3% playing 5 - 6 hours and

15.5% playing in excess of 6 hours a day. In terms of total game time, 49.6% played in excess of 19 months, 22.6% played between 11 - 18 months, 10.3% played between 4 - 6 months, 8.3% played between 7 - 10 months, and 8.8% played less than 3 months.

Table 3 below shows descriptives and reliability of each continuous variable of interest, which are the global TEI score and the four subscale scores.

Table 3: Descriptive statistics of TEI Scores

Variable	Mean	Std. Deviation	Cronbach's Alpha	Min	Max	No. Of Items
TEI Global	4.96	0.75	.89	2.63	6.77	30
Sociability	4.92	0.93	.67	1.83	7.00	6
Emotionality	5.02	0.95	.72	1.25	6.89	8
Well Being	5.11	1.14	.85	1.50	7.00	6
Self Control	4.92	0.88	.60	2.17	7.00	6

Note: Possible Range of each variable is 1 to 7

Analysis

Hypothesis 1

One-way between groups ANOVA tests were conducted between the generalized TEI scores, levels of social interaction and levels of grieving. No significant difference was found between levels of social interaction and TEI, so no post hoc test was carried out between them. There was a statistically significant difference in levels of grieving and TEI scores, at the $p < .05$ level, $[F(4, 247) = 2.65, p = 0.034]$. A post hoc Tukey HSD test was run, though no statistically significant result was found for any one group. Levene's tests were also run to examine the assumption of homogeneity of variance, and there was no violation in any of the groups.

To further examine the relationship between grieving and TEI, another ANOVA was run between Levels of grieving and the 4 subscales of TEI. A statistically significant difference was found in the Sociability factor [$F(4, 247) = 3.91, p = 0.01$], as well as the Well Being subscale bordering on statistical significance, [$F(4, 247) = 2.25, p = 0.06$].

A post hoc tukey HSD test revealed those falling within the 2 - 3 range of grieving levels differed significantly from those with low (1) and high (5) levels in terms of sociability EI scores; with a mean difference of - 0.70 and -0.68 respectively. While no statistically significant result was found in the Well being subscale

Hypothesis 2

One-way between groups ANOVA tests were also conducted between TEI scores, average time spent playing per day and length of time playing the game. No statistically significant difference was found between time spent per day and global TEI scores. A significant difference was found between length of time playing the game and the Self Control subscale, [$F(5, 250) = 2.93, p = 0.01$]. A post hoc tukey HSD test revealed a statistically significant difference between those who've played more than 19 months and those who've played between 11 to 18 months with a mean difference of 0.46. A Levene's test was also run to examine the assumption of homogeneity of variance, there was no violation in any of the groups.

Discussion

This section will cover the results of each hypotheses, including an interpretation of the results, suggestions going forward in each area of research, followed up by limitations of the study and finally the conclusions. But first, some observations on the descriptives.

The means of TEI scores were similar to those found in Herodotou, Kambouri and Winters (2011) examination of TEI in an MMO sample (World of Warcraft). With the biggest mean difference being + 0.26 on the Self Control subscale and global TEI scores only varying by 0.1. This shows a consistency within the MMO field of research, giving TEI some ecological validity.

The demographic breakdown of participants was in line with statistics publically released by CCP, the developers of Eve Online. The mean age of an Eve player as of 2014 was 31.96 (CCP, 2014) while the mean age in the study was 29.06. The Daedalus project reported a mean age of 26 for MMO players, so the sample can be considered representative of the population. The gender was severely skewed, but the playerbase of Eve is 96% male, so it's expected that the sample had 98% males. While the sample size itself may have been large at 252, some individual groups were comprised of extremely small sizes, there were only 17 high level Greifers, 8 participants who have been playing Eve less than one month, and only 48 in total who have played less than 3 months. This may account for the lack of significant results between such small individual groups. Overall the rest of the groups had a relatively normal distribution with reasonably large groups.

Hypothesis 1

As stated, hypothesis 1 was that TEI scores would differ between playstyles, as defined by levels of social interaction, and by level of grieving.

While levels of social interaction and TEI scores were not found to be related in any statistically significant way, levels of grieving had a non-linear relationship with TEI scores; specifically the Well Being and Sociability subscale factors. This is in line with the expectation that playstyle preference may have an impact on TEI, and that the sociability trait differed the most significantly. Although a non-linear relationship is surprising. Those who self reported that they never engaged in grieving behaviour did not differ greatly from those who reported high levels (mean difference of 0.19), while those who reported levels in-between varied to a greater degree (mean differences up to 0.69). This suggests that the self report nature of the study may have had a profound impact on the results; those who may have been unsure of the ethics of their actions may have been conflicted as to where they were on the grieving scale. Those who rated themselves very high, may also have a greater ability to differentiate between anti-social behaviours inside a virtual environment and outside one. This is in line with the literature which explores the relationship between motivation for play and grieving (Achterbosch *et al*, 2014). A relationship exists, though it is a complex one, shown by the non-linear nature. Future research into this area of grieving may need to differentiate grievers by their motivation for a more accurate estimation of TEI.

Though it is important to note, there were significantly less participants who rated themselves highly compared to other groups (Only 17 fell into high level grievers, compared to 94 who reported never engaging in grieving). There appears to be a significant difference between those who frequently grief and those who only occasionally engage in grieving behaviour . Frequency of greifing actions may have oversimplified the nature of grieving and future studies can examine the construct in greater detail.

As for why levels of social interaction had no significant relationship with TEI scores, this may also tie back into motivations. As Nick Yee's (2006a) Motivation study found, many

players motivations are complex and factors overlap in several ways. An achievement based player may engage in high levels of social play in pursuit of their achievement if that achievement happens to be rooted in a social context. Conversely a socially driven player may shy away from chasing achievement based gameplay altogether due to a lack of interest in that area. In regards to this study, players engaged in small corps, or large alliances may have different reasons for doing so and thus it may not be indicative of their social interaction within the group. Simply put, the level of social interaction may not correspond directly with the number of players participants interact with. The motivation behind their involvement could be a more determining factor. The key motivations behind where they are, are possibly more important. Further study into how social motivations play a role in player's behaviour could open up new avenues of classifying social interaction.

Hypothesis 2

Hypothesis 2 stated that if active participation in MMO play helped develop social skills, then TEI levels should be higher in those who play more frequently and for a longer period of time.

The results showed that neither time measurements had significant differences in TEI levels, with the exception that length of time playing had a relationship with the Self Control subscale factor. From a theoretical standpoint, this makes sense, as the self control subscale specifically attempts to measure one's ability to control urges and behaviours (Petrides, Siegling, & Saklofske, 2011). The longer someone had played the game, the lower their self control scores. This is the only result that suggests TEI score was affected by playing MMO's in any way, and links back into the literature on addiction studies. Those who play for longer periods are more likely to develop strong psychological attachments to the game world and thus exhibit lower levels of self control. Though the result would have to be reproduced with a larger sample size for each group to give this theory more merit.

Small group sizes may also account for no other significant results being found, as well as poorly chosen groups. Future research could try different time based variables, with a smaller number of groups. Two groups out of six accounted for 182 (72%) of participants, which shows a very uneven distribution.

It's also likely that MMO usage simply has no effect on TEI, whether its more accurately tested or not. Future research may attempt to find a different measurement for evaluation of developing skills within MMO. Perhaps one tailored specifically for virtual environments rather than adapting a workplace measure.

Limitations

Certain groups within the study were severely under-represented, this is a persistent problem within the area of research. Though an attempt was made to gain a more representative sample by approaching players within the game itself, and not simply from the online forums where only a certain fraction of the playerbase may frequent. Recruiting players directly from the game helps avoid biasing the sample with only forum users, but it is still very restrictive and time consuming to attempt to recruit a large representative sample. To avoid this problem in the future, it may help researchers dramatically if game companies provide support and utilities for use with data collection. This may present ethical problems, but would drastically increase the reliability and representativeness of any given MMO sample. Another problem with the representativeness of the sample was the relatively small sample of Grievers, who may inherently be the type of players less likely to respond to surveys. (6.7% to 14.2%) is not far off from similar research into griefing. As well as recruitment, the total time question, taken from Nick Yee's Daedalus project may have been ill-suited for use with Eve Online players, as the vast majority played for a much longer period than was expected (the 19+ months group alone accounted for 49% of participants). It may be useful to consider the age of an MMO while

collecting time based information, as the average player's total playtime will increase as the game itself ages.

The short form Trait Emotional Intelligence questionnaire, while useful for its concise nature, may have been an underpowered measure in comparison to the long form which would have offered greater statistical insight, as well as more powerful subscales, the Self Control subscale had only a moderate cronbach alpha of .60 which may have accounted for the statistically significant found with total time spent playing. Though using the long form of TEI would have tripled the length of the survey, and participation may drop off heavily if used.

Conclusion

While there was only limited success identifying key variables with a relationship with TEI scores, each hypothesis did identify at least one statistically significant result within each. With levels of greifing and length of time played showing significantly different levels of TEI, in one or more subscales. Though this showed some validity for the design and methods, further study in this area is definitely necessary to refine methodology to see if stronger relationships exist and were simply missed. TEI has already shown mixed results, though has been more successful in previous research in this area (Collins *et al*, 2012; Herodotou, Kambouri & Winters, 2011), the difference may be the inclusion of Motivations at Play scale. Clearly grouping players without consideration of their perceptions or motivations leaves out critical information. Understanding behaviour or playing patterns alone simply may not be enough, as researchers have to make their own inferences. This has backfired already in the research on both greifing and addiction studies, where problem behaviour has been oversimplified. Hopefully this study has shone some light into areas of MMO research that have not been explored deep enough, and while no conclusive results were found, there was still enough evidence to suggest a deep level of complexity that merits further investigation.

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Appendix A

Forum Post

I'm a final year psych student (At National College of Ireland, Dublin) doing my thesis on Emotional Intelligence in Online Gaming, specifically an MMO population. Eve has a certain level of social hierarchy built in, so the question is, are there any connections between different play-styles, behaviours and areas of emotional intelligence.

So that's what I'm doing, but as for why; I want to see if any real world applicable skills are developed or encouraged in the intense social aspect of gaming. Every day large communities of player work towards long term goals, or smaller bands of players use guerilla tactics to take on larger organisations. Does this affect different areas of EQ?

It should take between 5 - 10 minutes, no personal info is collected (apart from your email in the case of the optional PLEX draw) and all data will be deleted after completion of the study.

I'll be happy to share the results and any conclusions as soon as I finish, which may be in the distant future when science fiction has become reality

<http://goo.gl/forms/Ot8itFEfkg>

Appendix B

Google Form

Age *

Gender *

- Male
- Female

How do you primarily like to play *

- Solo
- Small groups (Private corp)
- Large groups (Large corp)
- Very large group (Alliance of several corps)

On average, how many hours a day would you spend logged in to MMO's? *

- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6
- 6+

How many months have you been playing this game (Eve Online)? *

Don't include unsubbed time if you have left for any period.

- 0 - 1 Month
- 2 - 3
- 4 - 6
- 7 - 10
- 11 - 18
- 19+

How often do you engage in what you consider "griefing" behavior? *

1 2 3 4 5

Never Frequently

Trait Emotional Intelligence Scale

Instructions: Please answer each statement below by selecting the number that best reflects your degree of agreement or disagreement with that statement. Do not think too long about the exact meaning of the statements. Work quickly and try to answer as accurately as possible. There are no right or wrong answers.

There are seven possible responses to each statement ranging from 'Completely Disagree' (number 1) to 'Completely Agree' (number 7).

Expressing my emotions with words is not a problem for me. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I often find it difficult to see things from another person's viewpoint. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

On the whole, I'm a highly motivated person. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I usually find it difficult to regulate my emotions. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I often find it difficult to show my affection to those close to me. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I'm normally able to "get into someone's shoes" and experience their emotions. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I normally find it difficult to keep myself motivated. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I'm usually able to find ways to control my emotions when I want to. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

On the whole, I'm pleased with my life. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I would describe myself as a good negotiator. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I tend to get involved in things I later wish I could get out of. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I often find it difficult to stand up for my rights. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I'm usually able to influence the way other people feel. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

On the whole, I have a gloomy perspective on most things. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

Those close to me often complain that I don't treat them right. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I often find it difficult to adjust my life according to the circumstances. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

On the whole, I'm able to deal with stress. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I often pause and think about my feelings. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I believe I'm full of personal strengths. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I tend to "back down" even if I know I'm right. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I don't seem to have any power at all over other people's feelings. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I generally believe that things will work out fine in my life. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

I find it difficult to bond well even with those close to me. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

Generally, I'm able to adapt to new environments. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

Others admire me for being relaxed. *

1 2 3 4 5 6 7

Completely Disagree Completely Agree

Enter your email if you would like to enter a draw for a free PLEX

This is entirely optional