THE REPETITION OF VIDEO GAME MUSIC, ITS IMPACT ON VIDEO GAME ENJOYMENT, AND HOW BEST TO MANAGE IT

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ABSTRACT

Video game music (VGM) has a functional role in video games which can cause it to be looped and repeated as it accompanies the player around the game world. This has an impact on players' video game enjoyment and engagement when players become overfamiliar with repeating VGM. There have been numerous approaches and techniques implemented in video games to attempt to conceal, reduce, and remove repetition of VGM. However, familiarity through repeated exposure to VGM has a positive functional role for players with regards to player feedback. This constructivist study focuses on the phenomenon of VGM repetition and its impact on the complex concept of video game enjoyment, and gauges how best to manage the phenomenon using various approaches, and techniques, used to conceal, reduce, and remove repetition of VGM. The current study conducted qualitative interviews with actual players who believed that VGM was important to their enjoyment of video games. A codebook was developed from these interviews and used to interpret the data using heuristic inquiry. Findings show that players understand the reasons for VGM repetition and believe that their video game enjoyment is contextually dependent on whether repetition improves their engagement. Players are generally tolerant of VGM repetition but can become overfamiliar with VGM when it repeats, which has an impact on their video game enjoyment. However, players are more appreciative of the functional role that repeating VGM has with regards to feedback as they become more familiar with the repeating VGM. Ultimately a pragmatic worldview is held by the author who believes that this study could be beneficial to other VGM research and the video game industry because it focuses on the perspectives of the players themselves.

INTRODUCTION

Video games have proven to be one of the most popular entertainment media that are consumed today and the games industry is one of the most profitable, and prolific, in the world. Bowman, Kowert, and Cohen (2015) explained: "[v]ideo games are a multi-billion dollar business. What was once a niche activity enjoyed by a few individuals has now become a media industry giant, reporting profits of more than the movie and music industries combined" (p. 131). This has meant that research into engagement of video games has increased in academia (Caroux, Isbister, Le Bigot, & Vibert, 2015; Mekler, Bopp, Tuch, & Opwis, 2014; Mitchell & Clarke, 2007; Whalen, 2004). Enjoyment has been described as being central to engagement associated with entertainment media in the previous literature, including video games (Boyle, Connolly, Hainey, & Boyle, 2012; Caroux et al., 2015; Mekler et al., 2014). Video games are engaged with for multiple reasons including enjoyment which is the positive player reaction associated with engagement (Caroux et al., 2015; Mekler et al., 2014), enjoyment has been discussed as an important characteristic of player-centred engagement (Caroux et al., 2015), and it has been suggested that enjoyment is a motivational dimension of engagement (Mekler et al., 2014); but the previous literature suggested that enjoyment has also been neglected with regards to research in video games (Boyle et al., 2012).

The popularity of video games and their study has also meant that VGM research has grown, although at a much slower pace (Bullerjahn, 2011; Collins, 2007c; Summers, 2012). As video games have grown in their complexity, and depth, VGM has also had to evolve from looped VGM of simple, and abstract, games, nowadays called retro games, to complex music systems that can react to the player and the gameplay (Collins, 2005; Lendino, 1998; Plans & Morelli, 2012). VGM is listened to differently compared to linear and traditional contexts, such as film, due to the interactive nature of video games (Bullerjahn, 2011; Collins, 2007c). This means that VGM has a functional role in video games which can cause it to be looped and repeated as it accompanies the player around the game world, often mirroring what is seen on the screen (Bullerjahn, 2011; Collins, 2007a, 2007c). Unfortunately it is impossible to compose unique VGM for every aspect of a video game due to the cost, time, and effort required which makes repetition inevitable (Collins, 2007a; Hoeberechts, Demopoulos, & Katchabaw, 2007; Holm, Arrasvuori, & Havukainen, 2006). This has created some issues for players and researchers alike. Previous literature has hypothesised that players can disengage with video games when they become overfamiliar with repeating VGM. For example, Aallouche et al. (2007) discussed non-linear VGM: "[r]epetition has its cost in the overall experience of the game: The gamer may become bored with the non-adaptive soundtrack and turn it off after a while" (Introduction, para. 1). The previous research has discussed various approaches and techniques that reduce, conceal, and remove repetition of VGM. However, with the exception of a handful of research, which suggested

players prefer reactive VGM systems that provide them with feedback rather than continuously looped VGM, most VGM research has not empirically tested this hypothesis (Adam, Haungs, & Khosmood, 2014; Chan, Daza, Kwan, & Basu, 2017; Wharton & Collins, 2011).

Some of the previous literature acknowledged that repetition could have an important positive functional role in video games. This was the implementation of a leitmotif, which is a repeating musical theme that is associated to characters, settings, narrative, and mood (Bribitzer-Stull, 2015; Collins 2007a; Green, 2010; Kovacev, 2009). When used in this context repetition of leitmotifs, which become familiar to players, can communicate meaning, they can aid and guide the player, they can help the player with aims and goals, they can focus the player, they can help with the learning curve of the game, and can provide player feedback (Bullerjahn, 2011; Collins, 2007a; Ivanescu, 2014; Summers, 2012). Also, repeating themes which become familiar to the player can add identity to video games, they can help with the continuity of the video game, and create a sense of unity across video game franchises (Brame, 2011; Collins, 2007a; Reale, 2011; Whalen, 2004).

LITERATURE REVIEW

Video Game Enjoyment

Previous media enjoyment, including video game enjoyment, literature has shown that enjoyment is a multidimensional and complex concept that has been researched using different perspectives. Enjoyment has been a difficult concept to define in the previous literature with regards to video games (Klarkowski, Johnson, Wyeth, Smith, & Phillips, 2015; Mekler et al., 2014; Tamborini, Bowman, Eden, Grizzard, & Organ, 2010; Tamborini et al., 2011). For example, Mekler et al. (2014) discussed that the ambiguity of video game enjoyment had led to confusion with other concepts and that measuring enjoyment had proven to be difficult. They explained that due to that ambiguity, much of the previous research was conflicting and neglected previous findings. Unfortunately there was no definitive concept that emerged from the previous literature which could be used to fully explain video game enjoyment. However, for this study the following perspectives of enjoyment have been taken into consideration as a partial definition. They have been included because they are relevant to the discussion in this study but they do not include all the dimensions of enjoyment, which have been omitted because they do not fit the purpose of this study.

Hedonic Enjoyment

Concepts such as fun, joy, happiness, entertainment, preference, and liking have all been used to describe the feelings of pleasure associated with enjoyment (Boyle et al., 2012; Caroux et al., 2015; Mekler et al., 2014; Riddle, Tay, & Wu, 2018). For example, Mekler et al. (2014) discussed that terms such as liking, fun, and preference have all been used synonymously with enjoyment, but argued that terms such as liking reflected the media message while enjoyment reflected the media message and the media experience. They also found that terms such as fun and pleasure had two different meanings in relation to enjoyment, where fun described enjoyment as a distraction and pleasure described enjoyment as absorption.

Pleasure, or hedonic reactions, have been used to describe the experience associated with enjoyment in the previous video game enjoyment literature (Chen, Lu, & Wang, 2016; De schutter & Brown, 2016; Rieger, Wulf, Kneer, Frischlich, & Bente, 2014; Sherry, 2004). For example, Abbasi and Jamak (2017) explained that consumers experienced various hedonic elements including pleasure, and fun, and that engagement had been measured through theoretical constructs which included pleasure. Banyte and Gadeikiene (2015) argued that pleasure was motivation for players to engage with video games, and involvement with playing video games. Chen et al. (2016) also perceived pleasure as being central to video game enjoyment, they discussed social games as hedonic systems, and considered the main

purpose for playing games as pleasure. Similarly Hamari (2015) viewed video games as hedonic systems and discussed that enjoyment was a predictor for purchase, and continued use. Hoffman and Nadelson (2009) viewed pleasure as the motivation for engagement with video games, and associated hedonic experiences with happiness, and cheerfulness. Sherry (2004) explained that entertainment emphasised emotional pleasure where media provided escapism into a fantasy world.

Although hedonic pleasure can be understood as a simplistic representation of enjoyment it is an important aspect of it which has caused researchers to link it with other theories, and should be considered as a significant dimension of enjoyment.

Mood Management

Mood management theory has been closely linked to hedonic pleasure and enjoyment in previous research. De Schutter and Brown (2016) explained that video games had been used to self-regulate emotional states such as boredom, and stress, because of the pleasurable hedonic reactions associated with enjoyment. Fang, Chan, Brzezinski, and Nair (2010) discussed that mood management could help players maintain positive states and lessen negative ones. Rogers, Wooley, Sherrick, Bowman, and Oliver (2016) also had a similar perspective, and described enjoyment as a result of hedonic reactions such as increased positive, and decreased negative, moods.

However, enjoyment with regards to mood management is not the only reason players engage with video games because other factors also have to be taken into consideration. Rieger et al. (2014) demonstrated that video games were able to act as mood repair and helped increase positive moods such as happiness, and decreased negative moods such as depression. However, the authors suggested that enjoyment and mood repair should be treated differently from each other due to the player's satisfaction of needs actually driving video game enjoyment. Shafer, Carbonara, and Popova (2011) also understood mood management theory as media that was selected for the purpose of repairing negative mood states or maintaining positive mood states. However, they argued that video games were too stimulating or would lead to an outcome that could worsen, or damage, moods. Shafer (2012) viewed entertainment and enjoyment as more complex than mood management in his study. Tamborini et al. (2010) also had a similar perspective and argued that mood management theory did not have an understanding of enjoyment beyond pleasurable hedonic needs satisfaction. They explained that mood management did not define enjoyment as anything more that pleasure-seeking, but the authors did respect that mood management theory played a role in enjoyment of video games.

Eudaimonic Enjoyment

Some authors looked beyond video game enjoyment as purely pleasure-seeking and argued that other non-hedonic factors added to video game enjoyment. In the previous literature this has sometimes been referred to as eudaimonic enjoyment which is associated with meaningful, thought-provoking, and moving experiences (De Schutter & Brown, 2016; Oliver et al., 2016; Rogers et al., 2016; Tamborini et al., 2010).

De Schutter and Brown (2016) explained that eudaimonic experiences occurred through thought-provoking, and moving, media content, and that it offered a different explanation of enjoyment that did not match hedonic frameworks. They discussed that sometimes media was enjoyed when it was sad, or horrific, and explained that meaningfulness, and artistic value, added to personal growth, and that media could be enjoyed because it was emotional. They also confessed that eudaimonia could not be separated from hedonistic experiences because they viewed engagement with meaningful media content as pleasurable. They associated eudaimonic enjoyment with pleasurable childhood activities which included the memory of playing video games for current gamers. The authors also found that playing with friends in a social context made video games more meaningful for gamers, and increased their eudaimonic enjoyment. Oliver et al. (2016) viewed eudaimonic gratifications as appreciation of meaning-of-life questions and insight related to the human condition. Rogers et al. (2016) also had the similar view that eudaimonic needs fulfilled insight into the human condition and helped with the understanding of life truths. The authors explained that hedonic and eudaimonic motivations were subjective, and varied from person to person. Tamborini et al. (2010) explained that satisfaction of eudaimonic needs was related to enjoyment of sad media content and perceived eudaimonia as distinct from hedonic needs, arguing that eudaimonia was more associated with introspection and expressiveness rather than hedonic pleasure-seeking. However, they considered both hedonism and eudaimonia as part of the conceptualisation of enjoyment with regards to needs satisfaction.

As with hedonic enjoyment the concept of eudaimonic enjoyment can be an over simplistic perspective of enjoyment even if the concept is an important dimension of enjoyment. Video game engagement can be regarded as more than just hedonic and eudaimonic enjoyment, and several different approaches have been undertaken to understand the complex concept of enjoyment.

Affective, Cognitive, and Behavioural Enjoyment

Video game enjoyment has been conceptualised in the previous literature using the tripartite model of affective, cognitive, and behavioural dimensions (Baek & Touati, 2017; Caroux et al., 2015; Fang et

al., 2010; Tamborini et al., 2010). Affective reactions were thought to be linked to emotions and affective states, cognitive reactions were thought to be linked to the player's judgments of video game elements, and behavioural reactions were thought to be linked to the player's behaviour during the video game (Caroux et al., 2015).

Several authors concentrated on one or two dimensions and linked them with other concepts. De Schutter and Brown (2016) explained that enjoyment had been conceptualised as a pleasurable, and positive, affect state that originated from media consumption. The authors also explained that hedonic pleasure was associated with both emotional (affective) and cognitive reactions. However, the authors' study only focused on older adults. Shafer, Carbonara, and Popova (2014) discussed affective reactions that were associated with presence, which is a sense of existing in the game world while having a normal conscious state, which increased levels of enjoyment for players. However, the authors understood that presence can be explained as more than just an affective dimension. Petralito, Bruhlmann, Iten, Mekler, and Opwis (2017) discussed both positive, and negative, affective reactions in their study. They explained that a balanced video game improved positive affect and enjoyment, but argued that negative affective reactions such as fear, anxiety, and player death could also increase enjoyment. The authors also understood that overly challenging or very difficult video games could increase negative affective reactions. Although the authors went in to greater depth in their study they still only discussed one dimension.

Mekler et al. (2014) argued that enjoyment was a positive cognitive reaction to media, and that there had been efforts made to distinguish between affective, and cognitive, reactions in the previous literature. This was an interesting and relevant study but was a systematic review of quantitative video game enjoyment studies. Shafer (2012) viewed positive affective reactions which increased with mastery of the video game. However, the author explained that enjoyment was only thought of as an affective reaction for some time in the previous literature, but the author argued that more recent research pointed out that affect and cognition were dependant on each other. Most research has agreed that enjoyment could be seen as a positive affective and cognitive appraisal of engagement (Caroux et al., 2015; Mekler et al., 2014). One study did focus on the behavioural dimension which the authors referred to as psychological reaction. Tognetti, Garbarino, Bonarini, and Matteucci (2010) argued that physiological reactions could be related to, and be a measure of, video game enjoyment, and concluded that physiological responses were good indicators of video game enjoyment.

However, there has been some previous literature that encompasses all the dimensions of the tripartite model. Tamborini et al. (2010) discussed that past research had defined enjoyment as a combination of affective and cognitive reactions, but acknowledged that enjoyment had been

researched differently by some authors who viewed enjoyment as affective, cognitive, and behavioural reactions to video games. Fang et al. (2010) understood enjoyment to be a mixture of affective, cognitive, and behavioural reactions. They explained that the different reactions were influenced by different factors such as personality traits of the player, player mood, and familiarity with video games. However, the authors perceived that the different factors influenced affective, cognitive, and behavioural reactions in subjective ways, which in turn had an impact on enjoyment. The authors also discussed that video game enjoyment was related to the positive and negative affective state of the player, such as excitement and frustration. In another study Vorderer, Klimmt, and Ritterfeld (2004) had a similar view on enjoyment but used the terms affective, cognitive, and physiological dimensions to explain media enjoyment, and viewed enjoyment as more than just affective reactions. However, the authors' study was theoretical. Wissmath, Weibel, and Groner (2009) also perceived that enjoyment was a combination of affective, cognitive, and physiological factors instead of one single factor. However, the authors' study only briefly discussed video games.

The tripartite model attempts to conceptualise enjoyment as a more complex phenomenon and should be considered as a possible explanation. However, enjoyment is discussed further in the previous literature and demonstrates there are other reasons why players enjoy video games, which should also be considered.

Motivation

Enjoyment has been researched by several researchers as a reason as to why players were motivated to engage with media, especially video games. For example, Boyle et al. (2012) explained that enjoyment is a key factor in motivating players to engage with video games, while De Schutter and Brown (2016) discussed enjoyment as the most important motivation for engaging with video games. Hamari (2015) connected enjoyment with the motivation to actually purchase video games. Lee, Chung, and Lee (2012) understood enjoyment as being the motivation users had to engage with technology, and claimed that enjoyment was the reason that players played video games. Mekler et al. (2014) also viewed enjoyment as the most important reason for why players are motivated to play games, and Procci, Bowers, Jentsch, Sims, and McDaniel (2018) argued that the players desire to enjoy the video game motived them to engage with it. Sherry (2004) discussed enjoyment of different genres of video games by males and females, and their motivations for enjoying their engagement.

These authors understood the role enjoyment has in motivating players to engage with video games but also understood that enjoyment was not the only reason for motivation which has led to some ambiguity. As with hedonic and eudaimonic enjoyment, motivation can be regarded as an important, yet oversimplified concept. Motivation does not attempt to explain enjoyment, it only attempts to

provide a reason as to why players are motivated to engage with video games for the purpose of enjoyment. However, some authors have suggested that the important motivational concept of self-determination theory (SDT), which is a motivational theory associated with satisfaction of psychological needs, could explain the reason why players enjoy video games and are intrinsically, and to some extent extrinsically, motivated to engage with video games for the purpose of enjoyment (Boyle et al., 2012; Ryan, Rigby, & Przybylski, 2006; Tamborini et al., 2010; Tamborini et al., 2011).

Self-Determination Theory

Self-determination theory (SDT) (Ryan & Deci, 2000) is a motivational theory that suggests that media enjoyment, including video game enjoyment, can be experienced because of a satisfaction of psychological needs (Ryan et al., 2006; Rogers, 2017; Schmierbach, Chung, Wu, & Kim, 2014; Tamborini et al., 2010). The three basic needs in SDT are: autonomy (the need to experience freedom), competence (the need to feel a sense of control and a level of mastery), and relatedness (the need to feel a connection to other people) (Boyle et al., 2012; De Schutter & Brown, 2016; Ryan et al., 2006;Tamborini et al., 2010). For example, Ryan et al. (2006) demonstrated that enjoyment was increased for players that had strong needs for freedom within virtual environments, challenge, and to develop relationships. They explained that players were intrinsically motivated to play video games because they enjoyed satisfying those basic needs which led to their well-being. Rieger et al. (2014) found that enjoyment was influenced more by needs satisfaction than player performance in a game, which was more important in mood-repair. However, this can be dependent on video game genre where performance can be more important in certain genres that emphasise high score, such as competitive multiplayer games. Rogers (2017) found that feelings of competence and relatedness impacted enjoyment of a video game by players. His research added credibility to the argument that SDT and enjoyment had a relationship, however, he also concluded that not all aspects of SDT had an impact on enjoyment.

Schmierbach et al. (2014) focused on game difficulty in their paper, and demonstrated that the relationship between game difficulty, and enjoyment, was mediated by competence. The authors explained that this was similar to the concept of flow, which is an optimal psychological state of absorption in engaging tasks. However, the authors did not discuss the other basic needs which may have created an oversimplified perspective of video game enjoyment. Bonus, Peebles, and Riddle (2015) focused on frustration management using violent video games, and argued that competency fitted video games because of their structure. They explained that because fulfilment of competency needs were related with the attraction to succeed in the gameplay, fulfilment of needs could increase enjoyment. Competency can fit the gameplay structure of video games but again this can be

understood as an oversimplified perspective of enjoyment because the authors believed that frustration may not be effectively managed by video games in the real world. Tamborini et al. (2010) proposed that enjoyment was more than the hedonic pleasure seeking models previously used in entertainment media and argued that the three basic needs of SDT played an important role in the enjoyment of video games, and ultimately that the enjoyment experienced by needs satisfaction, related to psychological wellbeing, motivated players to engage with video games. While the authors understood that hedonic enjoyment was not detailed enough to explain why players enjoyed video games, they also understood that their study was limited because it only focused on the three basic needs of SDT. Oliver et al. (2016) suggested that satisfaction of intrinsic needs associated with SDT improved enjoyment as well as appreciation of meaningful and thought-provoking content. They found that feelings of autonomy and competence had a relationship with hedonic enjoyment, while feelings of relatedness were more closely related with appreciation and eudemonic enjoyment. The authors attempted to add more complexity to SDT and suggested that video games could be meaningful experiences. However, the authors only used the two-factor model of hedonic and eudaimonic enjoyment, and applied SDT to them.

Mekler et al. (2014) discussed that competence and the satisfaction of needs, with an absence of guilt, was an important aspect of explaining enjoyment of video games. The authors' study was a systematic review of quantitative studies on video game enjoyment and concluded that video game enjoyment was understood as affective, and cognitive, enjoyment, but that needs satisfaction was only partly associated to video game enjoyment. Kim et al. (2015) confirmed that if the three basic needs of SDT were fulfilled they created enjoyment for the player when they were engaging with a video game. The authors concentrated on autonomy in their paper which focused on avatar customisation. They argued that gameplay that increased autonomy improved enjoyment because of a sense of control, and that autonomy was enhanced by customisation. This was an interesting study which had a different perspective on video game enjoyment. However, the authors' study had a very specific and narrow focus. In a separate study Kim, Chen, and Zhang (2016) found that autonomy was decreased by anthropomorphised non-playable character (NPC) helpers, and that diminished autonomy had a negative effect on enjoyment. This study was also very specific and had a narrowed focus which only focused on the need of autonomy in SDT.

Petralito et al. (2017) explained that adaptive mechanics that matched the difficulty in games to the players skill made players feel more competent, autonomous, and they related to other players more. The authors discussed that when the adaptive mechanic was implemented and needs were satisfied, enjoyment increased for players, and that excessively difficult games lowered feelings of competence, autonomy, and relatedness which made games less enjoyable. Riddle et al. (2018) suggested that the

need for competence and autonomy were very important aspects of enjoyment, and their study demonstrated that freedom, choice, and challenge were enjoyed the most by players. However, the authors only focused on violent video games in their study. Rogers et al. (2016) saw meaningful content as an aspect of relatedness and that co-op playing increased the players' fulfilment of relatedness needs which, in turn, improved enjoyment. It is understood that the need to feel a connection to other players in co-op multiplayer games is important. However, even if relatedness and eudaimonic enjoyment have a relationship they can still be independent of each other.

SDT is a valid perspective that helps to conceptualise video game enjoyment because it discusses the satisfaction of basic needs of players which motivates them to engage with video games. However, SDT is limited to only three basic needs which are not always met by players who enjoy video games. Although satisfaction of basic needs in SDT can improve video game enjoyment, SDT cannot fully explain enjoyment because other factors play a role in satisfying the needs of players, such as the need to feel gratification in uses and gratifications theory (UGT), which is a theory that explains why people use media for gratification (Boyle et al., 2012; Fang et al., 2010; Sherry, 2004; Tamborini et al., 2010). Also, other explanations as to why players are motivated to engage with video games for the purpose of enjoyment exist, such as challenge. However, SDT is an important dimension of enjoyment because it has been generally understood in the previous literature as being significant in increasing video game enjoyment, and has been understood as a partial explanation of video game enjoyment.

Challenge

Challenge and game difficulty has been associated with enjoyment in previous video game research. Challenge, enjoyment, and satisfaction of hedonic needs have shared a relationship (De Schutter & Brown, 2016). It has been an important motivational reason for engagement with video games (Boyle et al., 2012; De Schutter & Brown, 2016; Schmierbach et al., 2014; Sherry, 2004). Challenge has been connected to SDT, specifically competence, with regards to enjoyment (Boyle et al., 2012; Schmierbach et al., 2014). Some video games with very high difficulty have been proven to be enjoyable because of their excessive difficulty (Petralito et al., 2017). It has also been linked to the concept of flow in the previous literature (Aponte, Levieux, & Natkin, 2011; Mekler et al., 2014; Schmierbach et al., 2014; Sherry, 2004). However, Challenge should not be interpreted as an explanation of video game enjoyment but should be considered as a concept that motivates players and improves enjoyment.

Flow Theory

Flow theory (Csikszentmihalyi, 1991) has been used within video games research to help measure engagement, and has been shown to have a strong relationship with presence, immersion, motivation, and especially enjoyment (Kaye, Monk, Wall, Hamlin, & Qureshi, 2018; Schmierbach, Limperos, & Woolley, 2012a; Thin, Hansen, & McEachen, 2011; Weber, Tamborini, Westcott-Baker, & Kantor, 2009). Although not specifically created for video games the flow state has been viewed as being fully absorbed, or "in the zone" (Belchior et al., 2016, p. 152), for engaging tasks. With regards to video games and enjoyment it can be understood as an optimal psychological state where the skill of the player should be balanced with the difficulty of the video game, creating enjoyment for the player. For example, Sherry (2004) discussed: "[v]ideo games possess ideal characteristics to create and maintain flow experiences in that the flow experience of video games is brought on when the skills of the player match the difficulty of the game" (p. 340). However, flow is a complex concept and some researchers viewed flow as independent of enjoyment even if there was a relationship between the two (Boyle et al., 2012; Caroux et al., 2015; Mekler et al., 2014; Wiebe, Lamb, Hardy, & Sharek, 2014).

Aponte et al. (2011) discussed that researchers had used flow to measure enjoyment and linked challenge, or game difficulty, to video game enjoyment. The authors argued that good game design used flow theory to balance the video game difficulty with player skill while still keeping a level of tension for the player, which led to player enjoyment. Baumann, Lurig, and Engeser (2016) explained that achievement of flow states were a motivator for engagement with video games. They described flow as a special kind of enjoyment, and suggested that enjoyment had been used to demonstrate flow. However, the authors argued that not every type of enjoyment was flow and that enjoyment, and flow, should be measured independently. Bowman, Weber, Tamborini, and Sherry (2013) explained that flow had been linked to enjoyment in the previous literature, and that video game enjoyment was a result of the player obtaining a flow state. Although partially true players can experience enjoyment for reasons other than flow. Unfortunately the authors' study had an oversimplified perspective of enjoyment with regards to flow, performance, and challenge.

Boyle et al. (2012) discussed flow as an optimal state of pleasure in their study. The authors discussed flow and enjoyment with regards to player versus environment (PvE) gameplay, and they explained that flow had been one of the most influential terms for describing video game enjoyment. However, the authors did not attempt to explain enjoyment and flow any more than what the previous literature had suggested because their study was a systematic review. The study of Caroux et al. (2015) was also a systematic review of player-video game interaction which explained that flow was used in the previous literature to qualify positive gameplay experiences of players, but explained that flow was

created outside the domain of video game research. Klarkowski et al. (2015) argued that concepts such as enjoyment were difficult to define but flow was a useful and well established concept that lent itself well to video games when describing pleasurable reactions during gameplay. However, the authors found measuring flow to be difficult in their study because of the other immersive qualities of video games. Laffan, Greaney, Barton, and Kaye (2016) discussed that flow had been mentioned often with enjoyment in previous video game literature, and viewed flow as a positive state. However, the authors explained that not all the components of flow were positive such as anxiety and frustration. Mekler et al. (2014) discussed that enjoyment had a strong relationship to flow in their systematic review of previous video game enjoyment literature, but said that some research viewed flow as too restrictive because flow was only concerned with optimal states. In fact the authors explained that enjoyment had occurred independently from flow in a previous study and that flow had been considered distinct from enjoyment by some researchers.

Procci et al. (2018) suggested that flow was worth researching with regards to video game enjoyment. They described flow as an optimal state of intrinsically motivated enjoyment during video game engagement. However, other motivators exist such as SDT and challenge. Rogers, Bowman, and Oliver (2015) also explained flow as an optimal state of enjoyment. The authors discussed that the skill of the players were predictors of player performance and flow states. However, the authors' study focused on controllers for video games and only used flow as a measure of enjoyment. Schmierbach et al. (2014) focused on game difficulty in their study and discussed how the challenge-skill balance of flow had an impact on video game enjoyment. They also explained that skilful players reported higher levels of flow in difficult video games. The authors discussed that past video game literature had viewed flow as an indicator of enjoyment, it had confirmed a link between enjoyment and flow, and that video games offered a certain level of flow. The authors explained that previous studies had linked flow to challenge, performance, and enjoyment. However, the authors' study only focused on competency, flow, and enjoyment.

Sherry (2004) explained that flow had not been specifically designed for media enjoyment such as video games but suggested that it fitted well, and that media choice was motivated by the desire to achieve flow states. The author explained that video games characteristics were ideal for achieving flow states, but only when the optimal state of flow was achieved. The author continued to explain that when the video game was too difficult or too easy the player would feel frustrated or bored respectively, and that only when the player's skill matched the video game's difficulty as the player progressed through the video game did flow states occur. He concluded that flow offered an explanation for the gratification of enjoyment in his study. However, the author's study was a theoretical one and video game enjoyment can occur outside of the flow state for players.

Although flow has been shown to have an important relationship with enjoyment some caution must be taken. Flow was not specifically developed for video games and can be difficult to measure when players are engaged with video games. Enjoyment can occur independently from flow, and enjoyment with regards to flow is only experienced when the player is in the optimal state of flow. Flow is complex and there can be other aspects of flow which cannot be defined as enjoyable. While flow can increase enjoyment it cannot fully explain it, and flow can be an oversimplified explanation of video game enjoyment. There can be other enjoyment motivators such as SDT and UGT which are independent of flow, even if they have a relationship to it. Also, there are other dimensions of enjoyment which do not involve flow, but they can be understood as influencing video game enjoyment in equally important ways. However, flow is an important dimension of video game enjoyment, has been used to measure enjoyment, and should be considered as a significant contributor to video game enjoyment.

Performance

Player performance in a video game has also been linked to video game enjoyment in past research (Bowman et al., 2013; Hopp & Fisher, 2017; Rieger et al., 2014; Schmierbach et al., 2014). Hopp and Fisher (2017) argued that performance could be subjective as some players who were inexperienced, or had performed poorly in the past, and had achieved success in a video game viewed their subjective performance positively; and that some players viewed their subjective performance negatively when they had a high level of success in a video game due to their own personal standards. The authors explained that objective performance was the player's ability to meet or exceed challenges in the video game such as obtaining a high-score. However, the authors understood performance had a relationship to enjoyment and attempted to establish a link between the two in their study.

Rieger et al. (2014) discussed that players who performed well enjoyed the video game more but that enjoyment was more than just player performance within a video game. The authors explained that past research had linked player performance to self-efficiency (the player's belief in their own ability), which improved enjoyment. Schmierbach et al. (2014) agreed that player performance had been linked to enjoyment in the previous literature but argued that more research needed to be done to understand the relationship. They also discussed that self-efficiency and performance had a positive impact on enjoyment, that challenge and flow were linked to performance, and that performance could predict enjoyment. However, there are other predictors of enjoyment such as immersion. Bowman et al. (2013) discussed that performance was directly linked to pleasure derived from engagement. The authors viewed performance as a core aspect of flow and explained that the player's

ability to overcome challenges in the video game increased their enjoyment. Brockmyer et al. (2009) also related performance to flow states and enjoyment.

The previous literature suggested that performance increased video game enjoyment and it has been linked to other dimensions of enjoyment. However, it can be perceived as an oversimplified explanation of enjoyment and it should only be thought of as a dimension of enjoyment because it cannot fully explain it.

Control

Another concept which has been associated with enjoyment is the feeling of being in control. Control has been understood as the player's ability to immerse themselves within the game world, to control their actions with the situations of the gameplay and thus any outcomes associated with that agency, and has been viewed as the pleasure derived from the performance of the player within the video game environment (Bowman et al., 2013; Boyle et al., 2012; Fang et al., 2010; Klimmt, Hartmann, & Frey, 2007). Control has an important relationship with flow, in fact Csikszentmihalyi proposed that control was one of the necessary conditions of the flow state (Belchior et al., 2016; Procci et al., 2018; Sherry, 2004), and has been understood as an important aspect of the flow state in the previous literature. For example, Williams (2014) explained: "[r]ecent work has also argued that feelings of control impact both a flow experience and enjoyment within a video game environment" (p.143).

Klimmt et al. (2007) discussed that being in control was enjoyable but explained that enjoyment could still be achieved with a reduction of control, and argued that enjoyment was a more complex phenomenon. Tamborini et al. (2010) discussed that control led to positive player moods. Baek and Touati (2017) discussed the relationship between performance, and control, and explained that enjoyment was dependant on several factors including both control, and performance. Control has been associated with the satisfaction of basic needs of autonomy and competence in SDT in the previous video game enjoyment literature. For example, De Schutter and Brown (2016) discussed control with respect to competency needs when referenced to enjoyment. Kim et al. (2015) explained that a lack of control diminished autonomy within video games, and that control facilitated satisfaction of both autonomy, and competence, needs which had an impact on enjoyment. The authors argued that control was not enough to create enjoyment but was necessary for the enjoyment of video games. Oliver et al. (2016) also had the perspective that control satisfied autonomy needs which increased enjoyment.

While control can play an important role in enjoyment, especially as part of autonomy and competency needs in SDT, it is not necessary for enjoyment. However, a feeling of control by the player in the game world does increase enjoyment and it is mentioned because of this.

Immersion

Authors have discussed the relationship between immersion, flow, and enjoyment in the previous literature but saw them as different concepts (Leiker et al., 2016; Mekler et al., 2014; Rogers et al., 2015; Sherry, 2004). However, some authors discussed the relationship between immersion and enjoyment itself. For example, Bowman et al. (2013) recognised that players that immersed themselves into the game world reported higher feelings of enjoyment. Williams (2014) also had a similar view and explained that being transported into immersive, narrative rich, virtual worlds increased enjoyment. Fang et al. (2010) also explained that immersion into narrative worlds associated with entertainment media had a positive effect on enjoyment. Kim et al. (2015) discussed that immersion related experiences during gameplay were good predictors of video game enjoyment, although there are other predictors of enjoyment such as performance. Procci et al. (2018) also linked enjoyment to immersion in their study. Ribbens, Malliet, Van Eck, and Larkin (2016) focused on realism in games which they perceived as increasing immersion, and that the result of which was increased enjoyment for the player.

Immersion is a complex concept, an entire study could be devoted to it, and is beyond the scope of this study. However, it is worth briefly discussing because immersive experiences tend to be enjoyable. For example, Brown and Cairns (2004) posited immersion to be critical to video game enjoyment through implemented game characteristics, but found that immersion was not necessary for the enjoyment of video games. However, they also concluded that players did not have immersive experiences that they did not enjoy in their study. Immersion does increase enjoyment according to the previous literature and has a relationship to it, but should be considered as a separate concept to enjoyment because enjoyment can occur independently of immersion. It has been included in this study because immersion is an important concept in the enjoyment of modern video games, which have rich narrative game worlds and complex gameplay.

Presence

Similar to immersion is the concept of presence which has been thought of as a sense of being in the game world while having a normal state of consciousness, where the game world becomes more important than the players' physical reality, or a sense of "being there" (Martey et al., 2014, p. 529) in a virtual environment (Kim et al., 2015; Laffan et al., 2016; Martey et al., 2014; Procci et al., 2018).

Presence also has been shown to have a relationship with flow and enjoyment (Boyle et al., 2012; Schmierbach et al., 2014; Weibel, Wissmath, Habegger, Steiner, & Groner, 2008; Wissmath et al., 2009).

However, presence was shown to have a strong relationship with enjoyment. For example, Kim et al. (2015) explained that feelings of presence showed greater levels of video game enjoyment, and that presence was an important aspect of all entertainment media. Shafer et al. (2011) suggested that presence improved satisfaction with game engagement, that players took measures to maximise their presence within game worlds, and argued that presence was linked to enjoyment. Their study explained that players would remove distractions from their gaming environments, players would invest in more powerful hardware, and that players would use more naturally mapped controllers to improve their presence, and enjoyment. The authors also explained that as players succeeded they were motivated more to continue engagement, and that their sense of presence grew with their sustained engagement, which increased their enjoyment. Skalski, Tamborini, Shelton, Buncher, and Lindmark (2011) linked enjoyment with presence in exciting game worlds. They also focused on naturally mapped controllers and found that presence, and enjoyment, increased when controllers were more natural such as using a driving wheel controller for racing games. Williams (2014) also concentrated on presence and controller types, but also looked at 2D and 3D games with regards to their relationship with enjoyment. The author found that presence increased video game enjoyment and theorised that flow mediated this, however, the author did not measure flow in his study.

Presence increases enjoyment, but again enjoyment is not dependent on presence and can occur independently of it. However, as most modern video games emphasise immersion and a sense of presence into their rich narrative game worlds it should be included as a concept that increases enjoyment.

Gratification

Gratification has been understood as a form of enjoyment (Fang et al., 2010). Enjoyment has been discussed in entertainment media as one of the biggest motivators, or gratifications, for engagement with video games (De Schutter & Brown, 2016; Schmierbach, Xu, Oeldorf-Hirsch, & Dardis, 2012b). However, Oliver et al. (2016) argued that gratification went beyond hedonic gratifications, and discussed eudaimonic gratifications in their study. The authors explained that entertainment had the ability to provide content that was not just pleasurable but also meaningful and moving. Uses and gratifications theory (UGT) has been used to explain why people use media for gratification, especially enjoyment, and has been used in video game research for explaining the satisfaction of the player's

need to engage with, and enjoy video games (Boyle et al., 2012; Fang et al., 2010; Sherry, 2004; Tamborini et al., 2010).

Gratification and UGT can offer partial explanations as to why players engage with video games, however, there are other concepts such as SDT which can motivate players to engage with video games for the purpose of enjoyment.

Transportation Theory, Identification with Hero, Affective Disposition Theory, Suspension of Disbelief, and Suspense

Transportation theory, which has been understood as transportation into narrative worlds, has also been discussed in the previous literature and has been perceived to be enjoyable (Fang et al., 2010; Kim et al., 2015; Shafer et al., 2014; Williams, 2014). For example, Fang et al. (2010) explained that transportation theory could explain the enjoyment experienced by players when they were immersed into a narrative world, and by the consequences of that immersion. Kim et al. (2015) also discussed that previous studies had positively linked transportation into narrative worlds and enjoyment, and that experiencing higher levels of transportation led to greater levels of enjoyment. Transportation has been linked to flow, immersion, and presence in the previous literature (Kim et al., 2015; Shafer et al., 2014; Williams, 2014; Wissmath et al., 2009), but also has been associated with identification with characters (Fang et al., 2010; Shafer et al., 2014).

Identification with characters and identification with the hero has also been linked to increased enjoyment with video games (Riddle et al., 2018; Shafer et al., 2014; Tondello, Wehbe, Orji, Ribeiro, & Nacke, 2017; Trepte & Reinecke, 2010). For example, Tondello et al. (2017) explained that player character (avatar) customisation increased identification and enjoyment. Trepte and Reinecke (2010) suggested that players that identified with their avatar evoked higher feelings of enjoyment. The authors explained that identification was interconnected with video game enjoyment because players influenced attributes of their avatar, and that higher similarities between the player, and their avatar, could increase enjoyment. Shafer et al. (2011) discussed that identification with characters in video games was different to film or television because players do not always see their avatar, but that their avatar took on the attributes of the player. Identification has similarities with another concept called affective disposition theory.

Affective disposition enjoyment of media content has been understood as the user's empathy with, and moral judgements about, characters in narratives and their outcomes, and the pleasure derived from reinforcement of those judgements (Fang et al., 2010; Shafer et al., 2011; Tamborini et al., 2010). For example, Oliver et al. (2016) explained that enjoyment depended on narrative resolutions that

feature victory for the protagonist and defeat for the antagonist, and called the resolution "just" (p. 392). Tamborini et al. (2010) also agreed that enjoyment was felt when worthy characters were rewarded and unworthy characters were punished. In a separate study Tamborini et al. (2011) suggested that enjoyment was linked to satisfaction of needs when the need for retributive justice was met in disposition theory.

Suspension of disbelief was also discussed in the previous literature as an important condition in enjoying video games. The players ability to suspend their disbelief was understood as an important narrative element (Wissmath et al., 2009), it was affected by interactivity (Shafer et al., 2014), and it depended on the player's subjective willingness (Procci et al., 2018).

Suspense has been known to increase enjoyment (Boyle et al., 2012; Fang et al., 2010; Tamborini et al., 2010; Trepte & Reinecke, 2010). For example, Klimmt, Rizzo, Vorderer, Koch, and Fischer (2009) discussed that suspense had similarities to affective disposition theory, and explained that suspense arose from the uncertainty of success in the resolutions of outcomes with regards to narrative, and gameplay. The authors argued that due to the interactive nature of video games suspense was even more intense than in traditional entertainment media such as film. The authors argued that increased suspense had a positive impact on video game enjoyment, but also understood that enjoyment was a complex concept and that suspense was just another dimension of it.

These concepts focus on the narrative elements of video games but it is understood that they increase enjoyment and partially explain enjoyment, but mainly apply to modern games which tend to have rich narratives and complex gameplay. However, with the exception of suspense with regards to gameplay, they cannot fully explain why players enjoy simpler and more abstract video games which tend not to focus on narrative, and they may not have any impact on enjoyment in those genres of video game.

Feedback

Feedback has been linked to enjoyment in the previous literature as a component of flow (Belchior et al., 2016; Boyle et al., 2012; Brockmyer et al., 2009; Procci et al., 2018), but has also been researched independently and linked to enjoyment. For example, Klimmt et al. (2007) explained that perceived, immediate, and direct feedback of the player's actions were enjoyed because of the perceived influence on the game world, called effectance, by the player. Leiker et al. (2016) discussed that that game mechanics that included feedback were a pleasurable aspect of engagement and learning. Rogers (2017) argued that one of the ways that most video game enjoyment could be understood was through the type of feedback used in his study. His study focused on feedback and enjoyment with

regards to autonomy, competence, and relatedness needs in SDT. However, the author's study found that feedback did not always improve autonomy and competence, and should be implemented by carefully thinking about how it would be perceived by players. The study also discussed that too much feedback could overload the player, and should be implemented subtly or implemented into other aspects of the video game.

Although feedback cannot fully explain enjoyment it can be considered an important dimension of it, and has been included in the current study because VGM can provide the player with feedback.

Effectance

Effectance was also discussed as a possible explanation to why players enjoy video games. As described earlier effectance is the player's perceived influence on the game world (Klimmt et al., 2007). Klimmt et al. (2007) focused on effectance and control in their study, and argued that effectance increased enjoyment because video games elicited player perceptions of influence on the game world, and motivated players to engage with the video game environment. The authors linked control and effectance in their study, that effectance should facilitate control, and that effectance did not compete with control in video game enjoyment. Klimmt et al. (2007) discussed that effectance was a basic determinant of enjoyment, and that effectance "silently" (p. 847) contributed to video game enjoyment. Shafer et al. (2014) also discussed that effectance and control were determinants of video game enjoyment. Kim et al. (2015) viewed effectance as a factor of competence in SDT that increased video game enjoyment. Tamborini et al. (2010) also understood effectance as a component of competence in SDT, and the players' perceived enjoyment increased if the intrinsic needs of competence were met.

However, effectance is more suited to video games which have higher player agency, rich narrative game worlds, and complex gameplay. Video game genres which are abstract or simpler have lower levels of effectance and enjoyment in those genres may not be impacted by effectance.

Self-Efficiency

Feelings of self-efficiency, which is the player's belief in their own ability, has been found to improve player performance in video games, which in turn has increased enjoyment of video games (Rieger et al., 2014; Trepte & Reinecke, 2010). It has been linked to mastery, control, and feedback in the previous video game enjoyment literature (Trepte & Reinecke, 2010). It also has been understood as the player's willingness to pursue video game challenges (Sharek & Wiebe, 2014). von Gillern (2016) discussed that self-efficiency and player agency were important aspects of video game enjoyment. Although important in video games, self-efficiency cannot be understood as an explanation for why

players enjoy video games because belief in one's own ability does not always equate to enjoyment. What can be understood from the previous literature is that self-efficiency can be linked to other dimensions of enjoyment, and can be a factor that increases enjoyment.

Familiarity

Familiarity due to repeated listening of a piece of music has been studied in previous music enjoyment literature. Previous research suggested that repetition increased familiarity, and that familiarity lowered subjective perceived complexity with a piece of music, which in turn increased enjoyment for the piece of music. This has been derived from the mere exposure effect in the previous literature (Montoya, Horton, Vevea, Citkowicz, & Lauber, 2017; Pereira et al., 2011; Stalinski & Schellenberg, 2013; Szpunar, Schellenberg, & Pliner, 2004). The mere exposure effect model (Zajonc, 1968) argues that human beings evolved to fear the unknown and when they were exposed to new stimuli people experienced a wariness, and uncertainty. This instinctive fear response, and their negative feelings of it, subsided after repeated exposure (Montoya et al., 2017). Berlyne's (1971) research refined this and used an inverted-U model, sometimes called a Wundt curve. Berlyne's (1971) two-factor model posited that exposure to an arousing stimuli, such as music, led to increased familiarity with that stimuli which led to an increased preference for that stimuli, and this preference would reach an optimal before overfamiliarity led to decreased preference for the stimuli (boredom, listener fatigue, and satiation) (Chmiel & Schubert, 2017; Montoya et al., 2017).

Hargreaves (1984) discussed that repetition and familiarity had a relationship with each other, and that repetition greatly increased familiarity over short, and sustained, periods of time. However, he also believed that repetition and liking had a relationship, where repetition increased liking over short and sustained periods of time, but not to the same extent as with repetition and familiarity. The author explained that the subjective perceived complexity with music was also diminished due to repeated listening because familiarity with a piece of music decreased the listener's perceived complexity of it. His conclusions pointed out that familiarity could increase liking of the musical composition, and that his study could benefit music education. Hunter and Schellenberg (2011) explained that novel stimuli tended to be disliked but as the stimuli became more familiar due to repeated exposure they would become more liked until overexposure decreased liking of the stimuli. However, the authors' study suggested that openness-to-experience personality of the participants also had an impact on liking.

Madison and Schiolde (2017) argued that the mere exposure effect was central in the liking of music with regards to repeated listening whether the music was complex or simple, and that familiarity was the most important predictor for music liking. The authors' study was conducted in a naturalistic setting with music listened to in ways that participants would have listened to in normal contexts

which, the authors believed, added more validity to their study. Margulis (2013) also understood that the inverted-U model associated with Berlyne's two-factor model demonstrated that hedonic pleasure would increase with familiarity due to repeated exposure, and that overexposure would lead to decreased hedonic pleasure. The author also discussed that if a piece of music was perceived as complex, repeated exposure would decrease the subjective perceived complexity of it and that enjoyment of the piece of music would increase due to familiarity with it. However, the author's study only used short segments of an unfamiliar style of music with participants in an experimental setting which could have influenced the study.

Peretz, Gaudreau, and Bonnel (1998) explained that most people had experienced the mere exposure effect at some point in their lives, and argued that it could have been the reason that some people learnt to like music genres that they had initially disliked. However, the authors admitted that the mere exposure effect was simple to describe but was difficult to explain. Tavani, Caroff, Storme, and Collange (2016) discussed the mere exposure effect with regards to music satisfaction in their study, and explained that the use of the mere exposure model had its limits. The authors argued that while initial exposures had an impact on familiarity and satisfaction, overexposure had a negative impact on music satisfaction, and they attributed this effect to the inverted-U model. The authors explained that when people were exposed to continuously repeated pieces of music they quickly lost their satisfaction with that piece of music. However, when people were exposed to a piece of music, which was repeated incidentally, their satisfaction for that piece of music increased.

Video Game Music

Interactivity

VGM and video game enjoyment has had very little research in the previous literature. VGM has been understood to increase enjoyment of video games (Boyle et al., 2012; Cassidy & MacDonald, 2010; Mekler et al., 2014; Zhang & Gao, 2014). However, VGM is listened to very differently compared to linear music due to the interactive nature of video games.

Collins (2007c) explained that video games changed the way VGM was listened to compared to the conventional and linear ways of listening to music. She discussed that VGM was looped, repeated, cut off, controlled by the player, was interactive, and was consumed differently. The author explained that the role and function of VGM was contextually dependant when it came to video games due to this interactivity, and player agency, within video game environments. She discussed how the interactive nature of video games meant that they were non-linear and should be approached from that perspective. However, she did not define interactivity and did not explain how VGM was

communicated in different ways in that research. Collins' (2007c) study focused on the difficulties of researching VGM due to prejudice, the crossover between VGM and popular music (and popular culture), and the different approaches to VGM research. Although the author discussed repetition only briefly in this study she did explain that VGM was heard differently in video games compared to linear film music. She discussed that comparisons had been made in the previous literature to film music, but argued that due to the interactivity of video games VGM was produced and listened to differently. She explained that due to the competitive nature of video games, the constraints of technology, non-linear narratives, repetition in gameplay, and the excessive amount of time spent by the player in a scene (player delay) VGM research should be approached independently of film music. An interactive scene is usually made up of contextual game events and gameplay oriented player activity, which trigger cues for the VGM so that it accompanies the scene (Berndt, Dachselt, & Groh, 2012; Gasselseder, 2014; Gibbons, 2011; Lipscomb & Zhender, 2004). Of note was the perception that VGM should be appropriate to changes in the scene which provided feedback to the player. The author also explained that the player would act as some form of co-producer because they defined when the VGM was cued due to their actions within the video game environment.

Collins (2007a) explored interactivity in some earlier work, however, and addressed it by using the study of semiotics to help explain how VGM was communicated to the player. She focused on the player acting as both a receiver and as a co-transmitter of meaning. She was suggesting that the player had agency in a non-linear and interactive medium, which gave the player control over what they were listening to. She argued that this changed the way that music was communicated and perceived compared to a more traditional, and linear medium, such as film.

Bullerjahn (2011) discussed the repetition of melodies due to restarting a video game and repetitive gaming situations that were characteristic of VGM. The author also explained that video games were often repeatedly played over long periods of time and that the VGM could become fixed in the player's memory. Bullerjahn (2011) discussed interactivity and suggested that due to the way video games were engaged with meant that VGM was listened to differently. Her study did not specifically focus on repetition of VGM in video games, instead it was an overview of the then current state of the art and discussed then relevant VGM topics that were important in video games. However, the author discussed that VGM had been compared to film music because of similarities such as their use in narrative, the setting of mood and atmosphere, the communication of meaning, leitmotifs (recurrent musical themes associated to characters, settings, narrative, and mood), identification with characters, emotion, and foreshadowing, etc., but the author also argued that VGM had different roles because video games were interactive. She explained that when the VGM was appropriate to the scene it could act as a form of feedback when the scene changed, guiding the player in the video game

environment or warning them of danger. This interactivity has an impact on the way VGM is listened to in games - with VGM repeating in video games compared to the linear listening experience in traditional media such as film (Berndt, 2012; Collins, 2007a, 2007b, 2007c).

Looping and Repetition

In the domain of VGM there was limited research that focused on looping and repetition, however, the research was mainly biased towards looping and repetition as negative phenomena. Berndt (2012), Chan et al. (2017), Deliyannis, Karydis, and Anagnostou (2011), and Plans and Morelli (2012) cited Collins' (2005, 2007a, 2009) seminal research into VGM, and used her research to support the perspective that looping, and repetition, were negative phenomena which had a negative impact on engagement through subjective player experiences of game enjoyment. However, Collins' (2005, 2007a, 2009) research were not empirical studies and she did not support her perspective that looping, and repetition, were negative phenomena with any testing. Collins (2005, 2007a, 2009) did use industry perspectives and theoretical constructs created by other academics, but a lack of empirical evidence was still an issue in that particular research.

Looping of VGM for the purpose of this study is defined as when a musical composition, with a fixed duration, is replayed continuously for an unpredictable amount of time in an interactive scene, thus repeating, until a new interactive scene is triggered, which cues a new musical composition (Berndt, 2012; Berndt et al., 2012; Collins, 2007b; Lendino, 1998). This definition draws from Berndt's (2012) explanation:

> "[i]t is generally impossible to predict the amount of time a player will spend in a scene or how long a certain situation lasts until the player makes that triggering interaction. Thus, it is equally impossible to plan the length of the corresponding music in advance. The endless loop is the most common means today to musically stay at a situation for an uncertain period" (p. 412).

The issue of repetition arises when the player spends excessive amounts of time in a scene where the VGM is constantly looped (replayed), thus repeating until the scene changes due to game events or player activity which trigger cues for a new piece of VGM (that is also continuously looped until the scene changes again) (Berndt et al., 2012; Collins, 2007b; Gibbons, 2011; Gasselseder, 2014). Berndt (2012) explained:

> "[t]his effect is perceived even more intense [sic] since the player, when recognizing repetition, becomes consciously aware of the music and its contradiction to the scene. At this point even the best musical composition is in danger to disturb, bore, and annoy" (p. 412).

To clarify what this means with regards to looping and repetition: this is when a musical composition is replayed continuously in a scene, rather than looping and repetition being a part of the compositional structure of a musical form (Figure 1). Unfortunately, the hypothesis that looping and repetition have a negative impact on engagement is implied, but not inferred by the author.

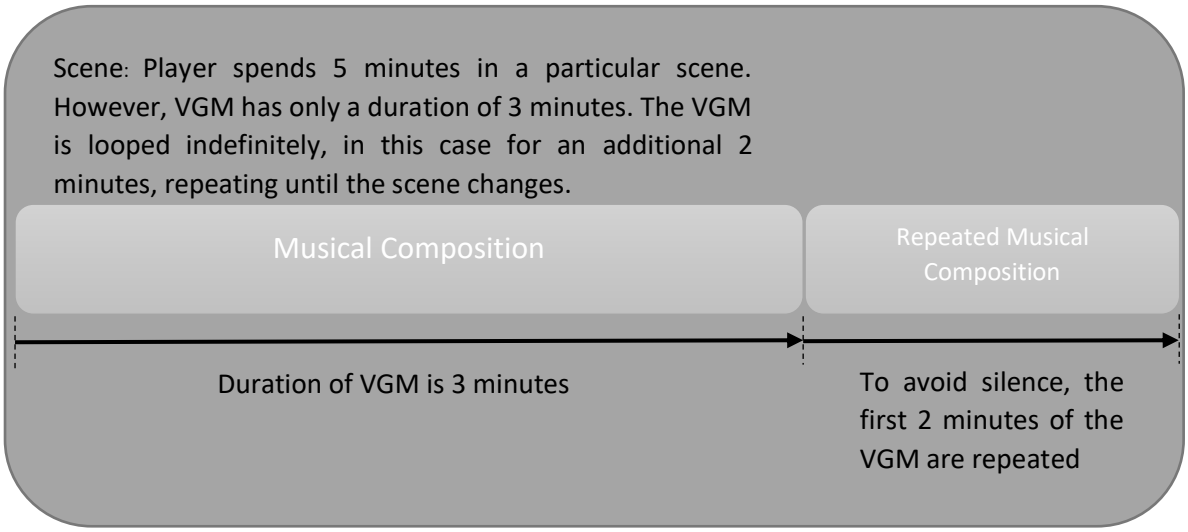

Figure 1. Repetition of VGM

Other VGM scholars also shared a similar view of looping and repetition in the previous literature. This is what Aallouche et al. (2007) had to say about looping: "many games simply loop the same relatively short musical material over and over" (Introduction, para. 1). Bullerjahn (2011) had this to say about repetition: "[n]erved by repeated musical structures and longing for concentration several game-players turn off the music. Also, it cannot be debarred that music, repeated over again in certain situations, does not achieve its purpose sometime" (p. 11). Hoeberechts et al. (2007) also had a negative perspective of repetition: "having a static collection of music can become repetitive, and fixed selections cannot be altered as part of the user's interactive experience during game play" (Introduction, para. 1). Lendino (1998) also had a similar perspective, and argued that: "[i]n most games it is impossible to determine how long a player will remain in a given segment of the game" (Composition, para. 3) and that: "[m]any games have a soundtrack composed of fixed length pieces of music. These usually loop indefinitely, until the player turns the music off in utter disgust" (Cueing, para. 1). Plans and Morelli (2012) discussed this in their study:

> "[h]owever, there is often a direct disconnect between the near nonlinearity of recent games, which can contain open worlds and narratives, and the use of repetitive music: often, users find the tail ends of composed pieces of music simply 'restarting' having run out of timed gameplay" (p. 192).

Plans and Morelli (2012) continued:

> "[i]f a segment is simply looped, it leads to tedium for the player, a problem acknowledged by Tomas Dvorak, composer of the soundtrack to Machinarium: 'Soundtrack music has to be more abstract to give space for the image and also to not be annoying if it repeats'" (p. 192).

Finally, Plans and Morelli (2012) explained: "[c]omposers have had to use new techniques to avoid the traditional, event-based approach where music is composed mostly of looped audio tracks, which can lead to music that is too repetitive" (p. 192).

Chan et al. (2017) also discussed repetition: "researchers continue to demonstrate interest in studying the implementation of procedural videogame music as a means to overcome the repetitive linearity of human composed videogame soundtracks" (p. 2328). Deliyannis et al. (2011) also shared a similar view: "[t]his often results in the use of musical scores that are indifferent and not pleasurable due to the high frequency of repetition, a factor that the user is not usually given the option to adjust according to preference" (Conclusions, para. 1). Wharton and Collins (2011) added that: "[v]ideo game music has traditionally been viewed as highly repetitive and often disconnected from gameplay" (Sound and Music Customization in Games, para. 2), and: "[t]he repetitive nature of game music meant that many players would turn the sound off altogether" (Sound and Music Customization in Games, para. 2). According to Collins (2009):

> "[m]any players engage in long gameplay sessions in which listening can become tiring, especially if a player spends a long time on one particularly difficult area of the game. In these cases, players may turn off the sound altogether, or may substitute in their own music playlist" (p.6).

All the authors above seemed to hypothesise that repetition due to looping was a problem and argued that the player realised repetition when VGM was looped. However, with the exception of Chan et al. (2017) and Wharton and Collins (2011) the authors provided no evidence to support this hypothesis.

Leitmotif, Theme, and Repetition

A leitmotif has been defined in the previous literature as a recurrent musical theme that is associated to a character, setting, emotional mood, and narrative (Bribitzer-Stull, 2015; Collins 2007a; Green, 2010; Kovacev, 2009). It has been used to communicate meaning to the player where it has aided and guided players, it has helped with aims and goals of the game, it had been known to focus the player, and also has been understood as helping them with learning curves. For example, Collins (2007a) discussed the use of repetition with regard to leitmotif in games as an important technique that aids the player throughout the game, she explained: "[p]articularly important to games is the use of sound

symbols to help identify goals and focus the player's perception on certain objects" (p. 8). Leitmotif has been used to guide the player through the game and helped the player with the aims of the game. Collins (2007a) continued:

> "leitmotifs are often used to assist the player in identifying other characters, moods, environments and objects, to help the game become more comprehensible and to decrease the learning curve for new players. The use of recurrent musical themes can help to situate the player in the game matrix, in the sense that various locales or levels are usually given different themes. By listening to the music, the player is able to identify their whereabouts in the narrative and in the game" (p. 8).

The use of repetition in this context is a positive phenomenon and has an important, positive, impact on the player. However, even though the author's study used industry perspectives it was theoretical.

Summers' (2012) discussed repetition with regards to leitmotif and argued that leitmotif in film music was a limited approach that increased repetition, and that the medium of film did not do the leitmotif justice. However, leitmotif in video games was critiqued in a positive light. The author understood that the amount of VGM that needed to be created for a video game was larger than compared to a film and that adaptive/dynamic systems, which are flexible VGM systems that react to the scene in real-time, were implemented in modern first-person shooter (FPS) games. This meant that the use of leitmotif in VGM worked better than it did in film because of player agency. The author explained that leitmotifs in video games were repeated to signify characters, settings, narrative, and communicate meaning to the player. He argued that when used fluidly, and dynamically, leitmotif acted as a form of continuity, and foreshadowing, as the player progressed through the video game. He suggested that as players become more familiar with the repeated leitmotif, the VGM becomes more meaningful for them as it linked certain concepts. He also explained that repeating leitmotifs gave certain video games their identity. However, his study was theoretical but did use industry perspectives.

The leitmotif technique can also be employed as a kind of musical foreshadowing indicating certain upcoming narrative elements to the player. For example, Scirea, Cheong, Nelson, and Bae (2014) explained that leitmotif could be used to foreshadow the appearance of a character or an event in a video game. However, the authors found that false foreshadowing created a more enjoyable experience for players because of an element of surprise connected to false foreshadowing and that it subverted expectations of the players.

This can be taken even further as theme music can be employed throughout the game acting as a form of continuity between scenes and as a bridge between previous scenes, helping the player remember

key moments in the game. For example, Collins (2007a) said: “[t]he recurrence of the theme in several places helps otherwise seemingly disparate scenes hold together and provides a degree of continuity across a game that takes weeks to finish, while reminding the player of previous scenes” (p. 8). Reale (2011) said this about continuity and a theme: “the recurrence of the title melody brings the player a sense of familiarity and unity” (p. 6). Whalen (2004) had this to say: “music works across a game's structure to encourage the user's continued play. The game's sequence is dependent on user input, so music that engages further participation can be said to function toward the continuity of the game play experience” (Super Mario Brothers, para. 3). The author’s study used linguistics, semantics, psychology, and compositional techniques to explain how VGM is used to communicate narrative, and atmosphere, to the player, and explored how cognitive theories of perception, immersion, engagement, and flow facilitated communication of the context, and gameplay, with regards to engagement. However, this was a theoretical study, with the author relying on examining empirical research conducted in the domain of film music, and applying the research to video games referencing research conducted in psychology. Unfortunately, his work did not focus on looping and repetition, and caution should be taken comparing VGM to film music because of the interactive nature of video games.

Theme music has been used as a form of unity across video game franchises where an iconic theme, or variation of an iconic theme, associated with that particular game, which also gave it identity, is reused because it was familiar to the player (Brame, 2011; Nitsche, 2008; Zhang & Gao, 2014). For example, Brame (2011) focused his study on thematic unity across a video game series in his study and explained that an iconic theme, which gave a game a certain identity, could be used across a series of games because it was familiar to the player. The author explained that variations of the theme could be used to keep each different video game’s VGM unique, but that the familiarity of the theme had some kind of meaning to the player and was expected to be present by the player. The author argued that unity kept some consistency between the different video games in that series, however, his study was theoretical.

Repetition in these contexts is also slightly different compared to the definition offered earlier in this study. With regards to leitmotifs and themes, repetition acts as a form of feedback to the player. For example, a certain leitmotif, which is associated to a particular scene, is heard when the player enters that scene, and this leitmotif, or a variation of it, is re-heard when the player re-enters that scene (Figure 2) (Collins, 2007a; Ivanescu, 2014; Plans & Morelli, 2012; Whalen, 2004). However, the piece of music can still continuously loop until the player leaves the scene meaning the player still hears repetition due to looping of VGM unless timed VGM cues are used (Collins, 2007a; Lendino, 1998; Summers, 2012).

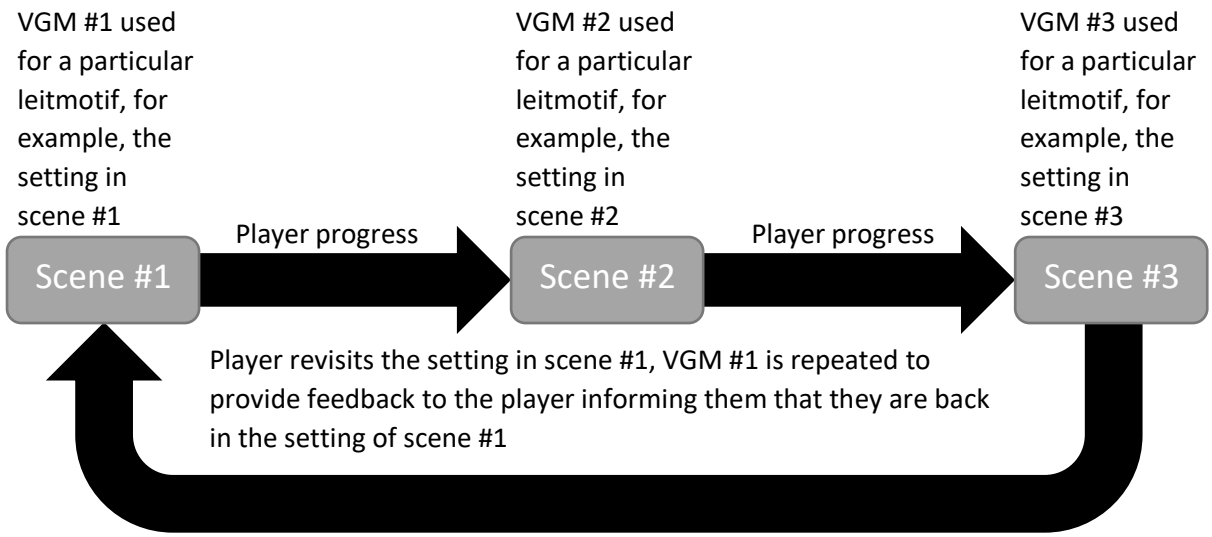

Figure 2. Leitmotif and Repetition of VGM

Approaches and Techniques

Variation

Due to the majority of the literature viewing repetition as a problem several approaches and techniques have been implemented that reduce, conceal, and remove repetition of VGM. Berndt (2012) discussed: "[t]o prevent such undesirable effects the repetition has to be concealed from the listener. There is [sic] a variety of ways to do this which ultimately lead to the concepts of musical variation" (p. 412). He claimed that looping was an established approach but it had significant issues with regard to repetition when the player became aware of looping, and his approach used compositional techniques in music variation to reduce, and conceal, the repetition. The author argued that the different approaches outlined in his study could be a solution to repetition of VGM and the approaches could be used together. Although this was an interesting approach, Berndt (2012) did not provide any support to the claim that looping and repetition of VGM were necessarily negative phenomena. What was clear from his work was that player delay cannot be foreseen by the VGM composer.

Berndt et al. (2012) discussed that composers of VGM for modern games attempted to delay the repetition by using compositional techniques. Although their study offered similar solutions to Berndt's (2012) original study, Berndt et al. (2012) understood that repetition had been used in entertainment media as an indicator of reoccurring content or action, which the authors described as "déjà vu like" (p, 61), and had been used in film music to communicate with the audience. The authors argued that the video game experience was different because the player did not revisit scenes and that nothing reoccurred. However, this is not always the case as players do revisit settings, characters,

narrative, and scenes in video games, e.g. when players perform repetitive game events and player activity such as combat where the VGM is repeated, and acts as a form of feedback to the player due to the use of the leitmotif technique.

Reale's (2011) study was on VGM's effect on player performance. His research specifically focused on how variations of the theme music in a particular game were used creatively to communicate familiarity and mood to the player, while having an impact on engagement. There were some interesting points made by the author, including how the player had agency in a video game, and that linear music was heard differently in video games compared to film because of that agency. However, his research was a theoretical study which used musicological and music theory approaches to explain the purpose of his study, and concluded that VGM had a positive effect on player experience. The focus was not on looping and repetition, but was notable because of his use of linear VGM, and how variations of the game's theme music were repeated to provide narrative foreshadowing, and feedback to the player. His study did discuss familiarity with regards to repetition of a VGM theme to convey mood to the player. He discussed how the use of a repeating VGM theme, and its variations, produced familiarity for the player, which in turn improved player performance while also conveying the mood of the game, and impacted engagement (see Leitmotif, Theme, and Repetition).

Silence, the Non-Memorable, and Catchiness

Lendino (1998) also had a negative view of looping and repetition but did not support it by providing any evidence. It may be that the problem of looping and repetition was viewed in this way because of the author's perspectives on the topic, but his view may or may not be shared by other players. The author discussed different approaches to creating VGM in his study and explained that silence could be a solution to the problem of looping of VGM in some video games. The author discussed that there was no need for VGM to be constantly playing in the background of some games and would only need to be cued at specific, important, moments in the game such as when the player encountered enemies. However, repetition occurs independently of looping in this context because VGM is used as leitmotif and is repeated to signify a reoccurring scene, such as combat, and provides feedback to the player. Lendino (1998) acknowledged that VGM should be constant in most games and said: "in many cases, some textural or ambient music will serve more effectively than silence" (Composition, para. 2). He also suggested that composers and producers of VGM should avoid using obvious musical cadences (the ending of a section of music), use a minimal style, and not use memorable melodies. The author argued that composers should use a creative approach that did not call undue attention to the VGM and to avoid catchy, strong melodies. The author explained that different instrumentation added variation to VGM, and that cutting VGM into smaller segments which could be arranged

differently would create modular VGM, which would be independent of each other (see Adaptive/Dynamic Music). The author explained that this worked better due to the unpredictability and interactivity of video games because each segment should stand up on its own. While his research was an interesting and early example of study into VGM, his research was more like a retrospective look at the different approaches to VGM creation. However, the author did give some examples of the different techniques used by composers when creating VGM, but it only provided techniques that reduced repetition by not using strong or memorable melodies in the VGM, or by using silence once the VGM had finished.

Collins (2007a) discussed that the VGM composer had a difficult job because there was a limit to how much VGM they could create, and as video games were growing in size, and complexity, the author explained that repetition of VGM was inevitable. The author understood that VGM would be reused in different parts of the video game (see Leitmotif, Theme, and Repetition), but in order to reduce the amount of repetition it was suggested that the composer should use compositional techniques to create less memorable melodies, and use variation to reduce repetition when VGM was repeated. The author continued that player delay in a scene was a problem when the VGM continuously looped, but explained that developers were implementing timing cues into their videogames so that if player delay occurred the VGM would fade out after a certain amount of time, leading to silence. However, there was some confusion about looping and repetition in the author's study. The author discussed both repetition *in* VGM and repetition *of* VGM without explaining the difference between the two which led to some ambiguity.

Gibbons (2009) also mentioned silence and repetition: "developers likely omitted music to avoid a tune becoming too repetitive" (p. 6), and had this to say about non-memorable VGM: "the tracks are straightforward and tuneful, largely designed to establish an exciting environment while remaining unremarkable enough not to grow annoying quickly" (p. 2). Summers (2012) discussed looping and repetition with regards to the FPS genre in his study. The author explained the use of non-memorable melodies, and formulaic composition of VGM, that were used to disguise looping, and repetition, in early FPS games. Also, the author discussed the use of cued music that was triggered by changes in the scene that would play for a certain amount of time before fading into silence in modern FPS games, and argued that this approach reduced repetition. As discussed earlier this approach may reduce repetition but the reuse of VGM to signify certain scenes means that repetition of VGM still occurs (see Leitmotif, Theme, and Repetition). In another modern FPS example, the author discussed a similar approach but with the added functionality of using a randomised system that used short musical segments, which added flexibility.

Adaptive/Dynamic Music

Early adaptive/dynamic music, sometimes called interactive music, was VGM that was appropriate to the scene. This meant that when the scene changed different cued VGM was triggered by a change in the game events or player activity. The VGM would loop for a limited amount of time before either the scene changed and triggered a new VGM cue, or if player delay occurred in a scene the music would loop until a timing cue was triggered causing the VGM to fade to silence (Collins, 2007a; Lendino, 1998; Summers, 2012). Modern adaptive/dynamic music is an approach and technique used to alter the VGM in real-time so that the same piece of VGM can be constantly played in the background but with minor changes to the structure, arrangement, instrumentation, dynamics, tempo, time signature, and key thus making the VGM appropriate to the scene, and diminishing repetition (Collins, 2007a; Gasselseder, 2014; Lendino, 1998; van Tol & Huiberts, 2013).

Gibbons (2011) suggested that with regards to player delay and adaptive/dynamic music: "[c]omposers compensated in often ingenious ways, creating repeating loops or music that could rapidly switch between multiple layers or transition to different music depending on a player's actions" (Popular Music and Games, para. 1). The author discussed that adaptive/dynamic music was used in modern games because it made the video game more cinematic and that licensed music did not have the flexibility to be used in adaptive/dynamic systems, which required VGM to be appropriate to the scene, due to its linearity. His study focused on licensed diegetic music used in a FPS game. Diegetic music is VGM that emanates from within the game world, it is heard by the player avatar and the player. Non-diegetic music is VGM that emanates from outside of the game world and is only heard by the player (Collins, 2009; Miller, 2007; Reale, 2011; Summers, 2012).

Aallouche et al. (2007) added this with regards to adaptive/dynamic audio: "[r]epetition has its cost in the overall experience of the game: The gamer may become bored with the non-adaptive soundtrack and turn it off after a while" (Introduction, para. 1). Aallouche et al. (2007) discussed a music oriented video game in their study and they proposed a video game that reacted to the player's own background music. The authors used an open-source video game that used the player's music to change game parameters such as level characteristics and difficulty. However, they explained that most modern games used adaptive/dynamic VGM that changed the VGM to fit (appropriate) the scene and that the creation of adaptive/dynamic music took a lot of effort. The authors argued that due to this effort, looped VGM was used instead and the player would turn off the VGM when it was non-adaptive due to boredom. Although looping and repetition were not the focus of their study the authors believed that familiarity with music increased engagement.

Holm et al. (2006) said this about adaptive/dynamic music with regards to looping and repetition: "[i]t is common that the background music is adaptive i.e. it changes according to game events, between different parts of the game, and is synchronized to the game actions" (p. 65). This research was similar to the above study but the authors explained that adaptive/dynamic music had its problems: "[t]he development of an adaptive music soundtrack and sound effects for a modern video game is an expensive and time-consuming process. Due to this, many games just loop the same relatively short music files over and over" (Holm et al., 2006, p. 65). Scirea et al. (2014) also discussed adaptive/dynamic music in their study: "the music composer in an interactive environment needs to create music that is dynamic and non-repetitive" (Introduction, para. 1).

These systems blur the line between looping *in* VGM and looping *of* VGM but essentially repetition still occurs. For example, there may be a theme with a set duration length associated to a setting which is broken down into separate segments of different variations, which leads to multiple ways of arranging the theme but the theme's leitmotif remains similar. However, when the duration of the theme comes to an end variation segment, a beginning variation segment is started immediately after it, essentially repeating the theme's leitmotif even if it is a variation of what was first heard by the player.

Procedural Audio

Procedural audio is a real-time system that uses inputs and algorithms to create non-linear VGM which is appropriate to the scene (Chan et al., 2017; Farnell, 2007; Veneri, Gros, & Natkin, 2008; Wooller, Brown, Miranda, Berry, & Diederich, 2005). Procedural audio was a popular approach in the previous literature with many researchers arguing that procedural audio was a viable approach used to reduce or remove repetition of VGM. For example, Adam et al. (2014) tested their procedural audio system in a game jam setting and implemented a survey to collect data. The authors discussed that their procedural audio system did not have the quality of traditionally composed VGM, but could be used to rapidly create VGM and be cost-effective in their study. The authors explained that procedural audio was usually implemented to modify VGM in real-time, avoiding repetition of the VGM, but due to the role and function that VGM must fulfil in video games procedural audio was rarely used to actually create the VGM. They explained that procedurally generated VGM usually was less aesthetically appealing than composed VGM. The authors found that looped composed VGM did not provide enough feedback to the players and warranted a need for an adaptive/dynamic system. However, this may not be because players disliked looped VGM but could be because looped VGM did not provide players with any feedback.

Hoeberechts et al. (2007) created a procedural music system for their study and explained that their system would create music dynamically, be more flexible, could be integrated with other software, be easy-to-use, could reuse elements form other compositions, and could alter music based on emotional context. The authors proposed that their prototype system had a future because creating VGM for video games was expensive due to licensing costs or due to hiring VGM composers and producers. They also discussed that composed VGM would become repetitive due to the limited amount of VGM that could be created, and that the VGM could not be altered during the player's engagement. However, there was some confusion in the authors' study as the authors discussed adaptive/dynamic and procedural systems as the same thing. In fact adaptive/dynamic systems do not have to be procedural, however, most procedural systems tend to be adaptive/dynamic where the VGM can change to fit (appropriate) the scene. Unfortunately the issue with procedural audio is that familiarity with the music can be lost due to the non-linear VGM created. The authors' system was appropriate to the scene providing players with a form of minimal feedback, e.g. warning the player that something had changed, but because it was procedural the player cannot become familiar with the VGM and make connections with regards to leitmotif which act as a form of specific feedback, e.g. warning the player that combat was about to begin with a familiar leitmotif.

Collins (2009) argued that procedural music would not have the limitation of composed VGM because it would use infinite, non-repetitive, improvisation to create VGM. The author explained that due to player delay standard looped VGM was unacceptable and that random-number generators were used to create variations of the VGM in procedural systems. She also explained procedural systems could add variation in instrumentation or change the arrangement of VGM in real-time when it was appropriate to the scene. While procedural these systems were also adaptive/dynamic. The author admitted that procedural audio had one important problem, it created VGM that due to its non-linear nature lost its intended meaning. She understood that composed VGM communicated meaning to the player which had a functional role in video games, she explained that this leitmotif was important in conveying information about the video game's settings, characters, and narrative, and that it gave the player important feedback. Collins (2009) said:

> "procedural music composers are faced with a particular difficulty when creating for video games: the sound in a game must accompany an image as part of a narrative, meaning sound must fulfil particular functions in games. These functions include anticipating action, drawing attention, serving as leitmotif, creating emotion, representing a sense of time and place, signalling reward, and so on" (p. 7).

Plans and Morelli (2012) supported their approach with an industry perspective, but they did not provide any empirical evidence as to how repetition impacts VGM. Their approach was to use procedural audio that was appropriate to the scene, and argued that the size, and complexity, of modern games warranted that approach. The authors claimed their system was a next generation tool, which could be used in all types of games and was not just targeted at large scale developers. However, the authors made unsupported claims into the negative impacts of looping and repetition, and argued that the need for a system such as theirs existed without providing any evidence to support their claims. However, the authors did acknowledge that outside the domain of VGM, repetition in music had been proved to have a positive impact on liking, and that the authors believed that not all repetition was bad, and superficial. The authors' procedural audio system used various programmed algorithms to produce experience based VGM which the authors argued created a more adaptive, emotionally intelligent, and evolving soundtrack. The authors explained that procedural audio reduced the requirement for memory in video games and was less intensive on the hardware used to run video games. They explained that their system avoided needless repetition and that repetition was counterproductive to engagement.

Chan et al. (2017) also focused on procedural audio in their study when they approached repetition of VGM. They discussed that VGM was mainly used to emphasise the atmosphere of video games and that the majority of VGM was linear composition similar to film music. The authors explained that VGM was composed to be appropriate to the scene in a video game and that the main purpose of this was to elicit an emotion from the player, which was intended by the developer. The authors argued that, unfortunately, this resulted in repetitiveness and player fatigue, and was more pronounced due to player delay. Their study focused on a proposed procedural music system that would facilitate player progression through a video game level that was created for their study, and their evaluation concentrated on player performance rather than on the player's evaluation of the procedural VGM's engagement, and enjoyment value. Their system was adaptive/dynamic, which meant that it would be appropriate to the scene and provide feedback to the player, and it would help guide the player through the level. They implemented a control variable of a composed piece of VGM that was continuously looped in their video game level and compared it to a second, duplicate, video game level that used their procedural audio system. The authors found that players completed the level that implemented the procedural audio faster than the level that used the looped VGM. The authors also found that the players preferred the procedural system over the looped VGM and found the video game more enjoyable, immersive, and engaging. The authors came to the conclusion that looping and repetition did not contribute to the engagement, and enjoyment, of video games after the first few times of hearing it. However, one problem existed in the experiment carried out by the researchers

that was not discussed. Their system was adaptive/dynamic, which helped and guided players around their level, while their control only used a looped piece of VGM which provided players with no useful feedback. Unfortunately, the authors overlooked that the possible reason that players enjoyed their system more could have been due to the fact that it provided player feedback, rather than players actually disliking looped VGM.

Playlists

Wharton and Collins (2011) also saw looping of VGM as repetitive which had a negative effect on engagement. The authors' empirical study focused on the use of customisable player-selected playlists which they proposed would improve player immersion, relieve anxiety, and improve player tactics in a video game. The authors discussed that participation was an important aspect of video games and that consumers customised, and personalised, end products to suit their own needs, and added their own content, ideas, and meanings to video games. Wharton and Collins (2011) explained that there were positive aspects to customisation, and said: "the ability of a player to input their own music has meant that players can no longer complain about the game music's repetitive nature" (Introduction, para. 3). The authors also understood that there were some negative aspects as well. They acknowledged that customisation changed the functionality of VGM in video games and also meant that composers had to relinquish control. The authors argued that changes in the functionality of VGM meant that the aesthetics of the game were changed and that the intended meaning, which was communicated by the VGM, was lost. They explained that the function of VGM was to add emotional content to the game, that it needed to be appropriate to the genre, and that it was designed around the style, and action, of the game, which provided players with feedback and would be altered by customisation. The authors explained that VGM evolved into interactive audio (adaptive/dynamic music) which could adjust to the scene partially due to repetition. However, they acknowledged that even then "repetition of the music is inevitable" (Wharton & Collins, 2011, Sound and Music Customization in Games, para. 3) due to game length and the amount of time players devoted to playing the game.

In their study the authors demonstrated that custom player-selected music playlists did reduce anxiety felt and that strategic use of music to improve performance, and player tactics, was feasible. However, the authors found that players were unable to choose music that improved their immersion and enjoyment. Players in the study preferred VGM that mirrored their gameplay and provided them with feedback, and one particular player in the authors' study found that they did not like a continuous looped atmospheric piece of VGM constantly playing in the background, and preferred a more adaptive/dynamic soundtrack which provided them with feedback as to what was happening in their

gameplay. This may have not been because the player did not like VGM repetition but could have been because the looped VGM did not provide them with feedback. The authors explained that players were disappointed when the music did not dynamically adapt to the gameplay to the point that it negatively impacted their performance, concentration, and immersion; this was for their own playlists and the VGM composed for the video game, which the authors suggested showed the importance of adaptive/dynamic VGM in games. Wharton and Collins (2011) explained that: "[i]n part as a response to the repetitive looping nature of game music, game composition has developed to be interactive with the player's movements and actions, and adaptive to game-play events" (Wharton & Collins, 2011, Sound and Music Customization in Games, para. 2). The authors also found that familiarity with players' chosen music had a negative effect on immersion and engagement, and familiar music was found to be distracting or even repetitive. However, Cassidy and MacDonald (2010) argued that familiarity of user-selected music had a positive impact on performance, and engagement, in their study on driving games.

Cassidy and MacDonald (2010) also conducted an empirical study that supported their hypothesis that music influenced the behaviour of the internal timing mechanisms of the player. Features such as tempo, liking, perceived affective nature, and listening contexts were the focus of their study. The authors compared the effects of self-selected and experimenter-selected music on actual, and perceived, performance in a driving game. Their quantitative and empirical study attempted to explain that music had an impact on the internal timing mechanisms of listeners due to the allocation of attentional resources. When this was applied to VGM the authors believed that the player's time estimates were inaccurate due to attentional resources being re-directed to additional music stimuli. Their results found that liking, enjoyment, appropriateness, performance, and engagement were higher when the music was self-selected. They suggested that the reason for this was that personal meaning and subjective associations attributed to self-selected music increased engagement. Although their study did not focus on repetition, what did emerge from their research was that familiarity with music had a positive effect on liking and game enjoyment. However, their study focused on racing games where VGM is appropriate to that genre of video game, but does not have the functional role of communicating meaning and providing feedback where it is appropriate to the scene.

Deliyannis et al. (2011) created a system which used social software-based musical content to create user playlists. The authors here made similar claims about the problems of looping and repetition, however, they also provided no evidence to support their claims. The authors used a system that incorporated music preferences sourced from the player's social software such as YouTube, Last.fm, and Facebook which created customisable playlists based on player preferences. The authors

explained that the player's preferred music information was retrieved from social software by their system; then their system obtained audio clips from iTunes; a beats-per-minute (BPM) calculation was processed through a web service; their system created a XML file that stored the audio clip URL and BPM information; and finally the music was played when their system required it. They demonstrated their system with a video game where the music's BPM linked to the player's score, i.e., the music changed as the player's score increased. Although it was an interesting approach, the authors admitted that their system was at a very early stage and that more research was needed for it to be considered a viable alternative in the future.

Retro Games

When it came to retro games and video games developed in the style, and aesthetic, of retro games scholars had a different perspective on looping and repetition. Mitchell and Clarke (2007) had a positive view on looping, and repetition, in retro games: "the iconic sound effects like the Pac Man 'munch' sound, and the repetitive looping of the background, jingle or 'idle' music. All of these play a part in making videogame music recognisable as such" (p. 395), and: "in the example of looping repetition, we have an essential strategy in videogame sound production that becomes an aesthetic and narrative device in videogame music" (p. 396). Collins (2005) explained the approaches and techniques used in retro games:

> "Kondo quickly mastered the limitations of the NES soundchip, managing to fill out its three tone channels with a clever use of percussion, catchy melodies, and smooth looping capabilities that used slight variations to keep the song from getting as monotonous as earlier games" (p. 5).

Gibbons (2009) discussed why loops were used in retro games saying: "much classical music was easily made into musical loops, which were a necessity for providing music with a minimum use of memory" (p. 2). Mitchell and Clarke (2007) also understood the technological constraints of the hardware: "[h]ere the form of the music or sound loop is a functional response to a technological problem of sound/music production" (p. 395). Kamp (2013) also had a more positive perception of repetition in retro games and said: "[t]he short, repetitive loops of the Tetris music add to this by affording a certain indeterminacy in the player's experience of the time played so far" (p. 245), and explained that looped VGM had an important functional role in retro games to provide feedback which focused the player. However, as the technology has improved the role of VGM has also evolved, as Collins (2005) suggested: "[m]usic quickly went from being a catchy gimmick designed to sucker quarters from unsuspecting passers-by in arcades, to being an integral part of the gaming experience" (p. 1).

Mitchell and Clarke (2007) focused on video game subculture in their study but the authors saw a positive use of looping, and repetition, in their study. The authors argued that looping and repetition of VGM was an iconic, and recognisable, aspect of retro games, and explained that looping was an important nostalgic aspect of the video game aesthetic. They discussed that loops were a functional solution to the limitations of video game hardware and development, but also argued that looping connected to popular culture. The authors drew comparison between hip-hop, techno, and house music due to the use of sampled loops in those genres of music, and discussed how retro VGM had an impact on dance music. The authors explained that looping was occurring *in* VGM due to similar production and technologies used in electronic music, and looping *of* VGM was occurring due to the technological constraints of the video game hardware. The authors also discussed chiptune, which is a genre of music created using the same, or similar, technologies of video game hardware, such as Nintendo's Gameboy and usually similar approaches, and techniques, used to create retro VGM. Finally the authors discussed the fan art and fan VGM communities in their study.

Collins (2005) discussed the history of VGM in her study which focused on the approaches, techniques, and technology used in VGM creation. The author discussed the technological constraints of retro hardware and the aesthetics of early 8-bit VGM, the refinement of the 16-bit era, the rise of recorded audio in the CD-ROM era, and the then current state of the art in VGM, such as interactive music (adaptive/dynamic music). She also explained that VGM was beginning to be accepted in popular culture through orchestral performances of familiar VGM and the commercial availability of VGM soundtracks. The author explained that the loop was the most common way of implementing VGM into early retro games due to the technological constraints of the video game hardware and the memory available. She discussed the use of non-memorable melodies as a technique to reduce repetition in retro games, but also explained that the VGM of that time purposely used catchy melodies with slight variations which became familiar to the player. The author also discussed the use of later software technology that made it easier to sequence loops in VGM.

In a separate study Collins (2007b) discussed looping and repetition in more detail where she explained the difference between looping *in* VGM as well as looping *of* VGM. However, the author only discussed VGM within 8-bit video games (retro games) where the VGM was a much shorter length compared to modern video games. She explained that looping was used due to the technological constrains of early video game hardware, the knowledge needed to program the hardware, and that looping was commonly used in the creation, and implementation, of VGM. The author explained that even in the 8-bit era, repetition was understood as an issue and that several measures were used to reduce repetition *in*, and *of*, looped VGM. One such approach was to use random-number generators in the code which randomly picked from a set number of loop options, essentially adding random

variation to what loop was played. Other approaches used arrangement techniques that only looped sections of the VGM, used different lengths of loops, or repeated sections in a different order. The author suggested that some systems were appropriate to the scene and changes in the scene which could be understood as early adaptive/dynamic. The author explained that looping and repetition was a result of the technology, and was also an important aesthetic of that era.

Gibbons (2009) focused on the use of classical music in retro games. He discussed that due to technological constraints of the video game hardware, the expense of licensing popular music, the time and expense required, and the technical skill required to create VGM, the use of non-copyrighted Western classical music as a source was used. The author explained that due to the ease of looping classical music, less memory was used in retro hardware, which had limited amounts of memory and audio capabilities. He drew comparisons to film music with regards to the VGM communicating meaning to the player and argued that because some classical music was familiar in popular culture it worked well in some video games, and added identity to those games. However, the author explained that because the VGM was not made specifically for the video game (appropriate to the genre and scene) it could have lost its ability to communicate the intended meaning and leitmotif to the player, which drew attention to the VGM and ran the risk of the VGM becoming the focus of the video game rather than it just being in the background. The author discussed that VGM was not always continually looped in some retro games and that there were moments of silence. The author argued that this was probably implemented to reduce repetition of the VGM. He explained that when the VGM was reintroduced, e.g. when a scene changed, it was noticed by the player and communicated significant moments in the video game for the player. The author also discussed the use of early adaptive/dynamic music, which increased in tempo, and added to the tension of the scene. However, while it is understood that looped VGM is an important aspect of retro games it is important to understand that all these studies were theoretical.

METHODOLOGY

Research Aims

The focus of this study was on the impact of repetition of VGM on video game enjoyment, where player enjoyment of a video game acts as a measure of player engagement. Repetition in the context of video games is a unique phenomenon (Bullerjahn, 2011; Collins, 2007a, 2007b). Due to the interactive and non-linear nature of video games it is difficult to predict the amount time the player will remain in a scene. Looping the VGM is a common technique used to solve this issue. This can lead to repetition of the looped VGM due to player delay (Berndt, 2012; Collins, 2009; Plans & Morelli, 2012). Previous literature within the domain of VGM mainly focused on several approaches and techniques that conceal, reduce, or remove repetition, which had varying levels of success, but did not fully address if repetition was actually a problem. However, literature outside of the domain of VGM suggested that repetition of music had a positive impact on listener enjoyment due to familiarity (Hargreaves, 1984; Madison & Schiolde, 2017; Margulis, 2013; Peretz et al., 1998). Furthermore those approaches and techniques also had an impact on the communication of meaning to the player, where familiar leitmotifs acted as feedback to the player (Collins, 2007a; Gibbons, 2009; Summers, 2012; Wharton & Collins, 2011). Therefore, the research question asked in this study was:

- Is the repetition of VGM a negative phenomenon that disengages players during their video game experience?

Unfortunately, there was no empirical study into the repetition of VGM on video game enjoyment, with player enjoyment being a measure of player engagement. This study hoped to change that, therefore the aims of this study were twofold:

1. To examine the phenomenon of repetition of VGM on video game enjoyment, where player enjoyment is a measure of player engagement;
2. To gauge how best to manage the phenomenon of repetition of VGM using various approaches and techniques that conceal, reduce, or remove repetition of VGM.

Study Overview

The philosophical and theoretical orientation for this study was constructivism. However, this was not a pure ethnographic study. Other strategies, and traditions, of heuristic inquiry and pragmatism were used as a construct for this study. Heuristic inquiry was used because of the personal experience of the author with the phenomenon of VGM repetition, and the author believed that the players themselves should be viewed as important contributors involved with this study, adding flexibility to the research. Also, a pragmatic worldview was adopted because the author understood that this study

may have an impact beyond epistemological perspectives and theory, and could have a practical impact on VGM composers, and producers, within the industry who view looping and repetition as only negative phenomena (Burns, 2000; Clough & Nutbrown, 2007; Creswell, 2014; Flick, 2014).

A qualitative approach was undertaken due to the purpose of the study and the audience, with the study constituting basic research. The purpose of the study has been discussed earlier, but the author believed that a qualitative approach offered more meaning to the phenomenon being studied, the culture that surrounds the phenomenon, and to the players being studied. A qualitative approach explained the phenomenon by providing depth and flexibility to the inquiry. It was understood by the author that doctoral candidates are typically expected to make theoretical contributions in their theses. Although it is was not the intent to generate theory in this study, the author was aware that new knowledge should be generated, and that they should have explored the nature of reality with regard to the phenomenon being studied. It was the author's intention to understand and explain the phenomenon, not just from within the domain of video games, but also, possibly, other disciplinary traditions, such as video game enjoyment and music familiarity. However, the audience for this study remained VGM researchers, VGM artists, composers, and producers, and video game developers that are responsible for VGM implementation. It is believed by the author that the purpose of this study required this emergent design because of the importance of the player in the culture that surrounds video games (Burns, 2000; Clough & Nutbrown, 2007; Creswell, 2014; Flick, 2014).

It was understood by the author that substance significance was used where the findings were judged by the presentation of findings and conclusions, and where the readers of the study would make their own judgements about the significance of the findings. It was the author's responsibility to address questions about the coherence, consistency, and solidity of the evidence in support of the findings. It was the author's responsibility to question the extent that the findings increased and deepened the understanding of the phenomenon studied, to question that the findings were consistent with other knowledge, and that the findings were useful for the intended purpose of the study. This depended on the author's own intelligence, experience, and judgement, while considering the audience (Burns, 2000; Clough & Nutbrown, 2007; Creswell, 2014; Flick, 2014).

Questionnaire

Design

Communication

In order to obtain participants for the main study a questionnaire was created which allowed the author to select participants from respondents. The questionnaire was self-administered and

computer based with the respondents' full consent, and co-operation. It was understood that questionnaires are intrusive, they compete for time and attention of respondents, and rely on the goodwill of the respondents (Peterson, 2000). It was the author's responsibility to create questions so that respondents could interpret them the same way. This was important because respondents must be able to reply to questions the way that the author intended. It was understood that the author must interpret the respondents answers in the way that the respondents intended, and that respondents should provide an answer which contained the requested information. An effective questionnaire was one which matched the ability of respondents to understand and answer it in a meaningful way (Peterson, 2000). A questioning strategy was used to remove ambiguity and avoid miscommunication in the questionnaire.

Questioning Strategy

A general questioning strategy was used in creating the questionnaire to gauge the amount of structure the questioning required. The amount of structure was the degree to which the respondents were asked identical questions and the degree to which they were asked in an identical way. Completely structured questioning usually involves asking all the respondents the exact same questions in exactly the same order, where all the answers would be predetermined and all the questions are closed-ended. This lends itself to a standard, uniform questionnaire. Structured questioning usually means that the answers can be generalised due to this standardisation, but some familiarity with the topic of interest must exist from the researcher. Completely unstructured questioning relies on every question following the previous answer, where the respondents are not asked identical questions and permit multiple different, and unique answers. Unstructured questioning can be flexible but can be time-consuming because it can be difficult to interpret and analyse. This also requires some familiarity with the topic of interest from the researcher but it also requires some experience of questionnaire creation (Peterson, 2000). It was decided that the information required from potential respondents would need to be the same in order to obtain participants for the main study. The information required would need to be the same so respondents could be analysed in the same way to determine which were feasible for the main study, and because the questionnaire was only created to select potential participants it would keep the cost down in terms of questionnaire creation, and analysis. A semi-structured questioning strategy was used which asked respondents the exact same questions in exactly the same order, however, the potential questionnaire used a combination of closed-ended and open-ended questions, which allowed a certain amount of flexibility.

To gauge the degree of directness a general questioning strategy was used again. The degree of directness is the degree of which direct questions are asked about the topic of interest, and refers to how much information is disclosed to the respondents about the purpose of the study. Full disclosure means that respondents are told everything, or practically everything, about the study in a transparent way. Whereas projective questioning can be used when respondents are told nothing, or very little, about the study (Paterson, 2000). Full disclosure was considered but was ultimately not used because the author felt that respondents at this stage did not need to know the full purpose of the study. It was decided that participants for the main study that were selected from respondents of the questionnaire would be given full disclosure, but at this stage it could have created answer bias from respondents and influenced their responses. It was decided that projective questioning was a better strategy and that potential questions would be direct, where only a small amount of information was given to potential respondents at the beginning. This was a short sentence that gave some basic information about the potential questionnaire.

Informed Consent

Informed consent is where respondents are given sufficient information about the study so that they can make an informed decision about whether they want to participate. It was understood that, if possible, respondents' identities should be kept anonymous and their replies to the questionnaire should not be traceable back to them. For example, an explicit statement was made that discussed confidentiality in the introductory section of the questionnaire, which reassured potential respondents. However, if identifying respondents was necessary their replies must be kept confidential. For example, the names and contact email addresses were required for contactable reasons and to identify respondents for the follow-up interviews of the main study (Oppenheim, 2000; Peterson, 2000). A short statement was created that explained this and was placed at the beginning of the potential questionnaire.

Questionnaire Construction

Information Requirements

The need for a questionnaire existed because information-rich participants were required for the main study, which incorporated follow-up interviews to discuss the topic of repetition of VGM. Information-rich participants are participants that add insights, understanding, and credibility to the study because these participants can add knowledge about the topic of interest, and are important for the purpose of the study (Patton, 2002). The most important decisions made stemmed from knowing what to ask and why, which meant thinking about what required information was important to obtain from the

respondents in order to filter and select them for participation in the main study (Peterson, 2000). The information requirements for the purpose of this study were: repetition of VGM, engagement (player experience), and video game enjoyment.

Developing Questions

It was understood that potential questions in the questionnaire should be as specific as possible, which made their evaluation easier and made their possible inclusion into the questionnaire easier. The potential questions were screened with regards to how their possible answers were to be analysed, the possible information obtained from them, and how the information was to be used. It was understood that certain direct costs, such as the cost of construction, administration, analysis, and interpretation would be associated with the development of questions. It was also understood that certain indirect costs, such as unanswered questions from respondents due to time constraints and other personal reasons, would be associated. It was decided that only questions that provided the relevant information would be kept for evaluation (Peterson, 2000).

Evaluation of Potential Questions

Questions that were screened and found to be potentially applicable for inclusion in the questionnaire were evaluated for their administrative viability in how respondents would react to the question, for example, can respondents understand, answer, and would they answer the question. It was the author's responsibility to evaluate how the questionnaire was administered, the language used, and the cognitive capabilities of the respondents (Peterson, 2000).

Understanding the Questions

Potential questions were evaluated for whether the respondents would be able to understand them. This was done by using the perspectives of absolute and relative understanding. Absolute understanding asked whether respondents understood the literal meaning of the questions. Potential questions should not be ambiguous, not use too technical terminology, or be too abstract so that respondents were able to come to a literal understanding of them. Relative understanding asked whether respondents understood the pragmatic meaning of the questions, where potential questions should have the same understanding of them by both the researcher and the respondent (Peterson, 2000).

Answering the Questions

It was understood that some information was required from respondents so that it could be gauged if they had sufficient knowledge about the topic of interest. This required some form of screening

questions or statements that qualified respondents with regards to their knowledge about VGM and engagement. Most respondents only remember situations that were significant to them, or may have remembered them vaguely, which could have led to recall errors and was another consideration. It was also important to understand that if potential questions were misunderstood, or respondents had some difficulty in answering the question, they could have been answered in a way that respondents interpreted them (Peterson, 2000). Several potential questions were created that were used to obtain information-rich cases.

Refusing to Answer Questions

Even if respondents understand the potential questions there is no guarantee that they will answer them and answer them sincerely. Respondents may refuse to answer potential questions because they believe it will be too time consuming or would require too much effort. It was understood that intrusive questions may not be answered by respondents and was a consideration in the evaluation of potential questions (Peterson, 2000). The potential questions were kept as direct and simple as possible in an effort to reduce refusal rates of potential respondents.

Mode and Study Respondent Considerations

It was important to understand the mode of administration of the questionnaire because this could have had an impact on the accessibility of the questionnaire, the ease of replying, the number of replies received, and it could have influenced the potential answers given by the respondents. Also, some knowledge of target respondents was important because they may or may not have been involved in the topic of interest, which would have an impact on the potential answers they gave (Peterson, 2000). The final questionnaire was administered online through Google Forms because of the low cost of administration for the author and the ease of reply for the respondents. The URL was sent to over 200 potential respondents through my supervisor's LinkedIn who were working in the video game industry or had studied video games at university. Also, the University of Huddersfield's Games Design Facebook group page was utilised to reach out to current video game design and programming students. This group also included alumni of video games design and programming courses at the University of Huddersfield. This ensured that potential respondents were at least video game players or had some interest in video games.

Open and Closed-Ended Questions

A mixture of closed-ended and open-ended questions were used in the potential questionnaire. Closed-ended questions are questions that have pre-determined answers that are chosen by the researcher and use specified response categories which limit the response the respondent can give.

Closed-ended questions usually require some prior knowledge of the topic of interest from the researcher and how the responses will be used in the study. They tend to have a higher cost with regards to the development and resources needed in constructing meaningful answers. Closed-ended questions are usually easier to answer for the respondents in terms of time and effort required to answer them. It also means that respondents are more likely to answer them and are easier to code, analyse, and interpret by the researcher. However, the relative low effort required in answering them also means that respondents may not provide meaningful answers and may feel pressured into answering them, which is called the ballot effect. This results in overestimating the importance of pre-determined answers and underestimating the importance of omitted pre-determined answers. It was also understood that the pre-determined answer alternatives should be mutually exclusive, which means that the respondents could only give one answer, and should be collectively exhaustive, which means that every respondent can give an answer (Oppenheim, 2000; Peterson, 2000). Several closed-ended potential questions were considered for the questionnaire. Potential closed-ended questions were created that asked about the respondent's opinions, perceptions, attitudes, and beliefs about VGM, and their enjoyment of video games.

Open-ended questions are questions that have no specific response categories or pre-defined answers where respondents are free to give an answer they choose. They tend to be more versatile than closed-ended questions and are normally used to provide answers that illuminate or explain specific research findings. They can be used in questionnaires because they can help in understanding a phenomenon or topic of interest, they do not influence a response in ways that pre-determined answers can do (bias), tend to offer more flexibility in the responses, and can be used as a follow-up question to closed-ended questions (Oppenheim, 2000; Peterson, 2000). Potential open-ended questions were created that asked about the respondent's opinions, perceptions, attitudes, and beliefs about VGM, and their enjoyment of video games.

Their use as follow-up questions can be useful for explanatory questions, probe questions, and elaboration questions, which can be asked when respondent knowledge is required for the topic of interest or phenomenon. These types of follow-up questions are important because they can ask respondents to explain and provide a rationale for the original closed-ended questions asked, they can ask additional information from respondents, and can ask respondents to expand on their previous answers because they are dependent on the previous given answer (Oppenheim, 2000; Peterson, 2000). Potential follow-up questions were created that asked about the respondent's opinions, perceptions, attitudes, and beliefs about the repetition of VGM.

Open-ended questions usually have a lower cost in terms of time and effort required to create them compared to closed-ended questions because no pre-determined answers need to be created. However, open-ended questions have a higher cost for the respondent in terms of time and effort needed to answer them, and for the researcher in terms of the time, and effort, needed to analyse and interpret them. Unfortunately open-ended questions have higher refusal rates and the answers tend to be vaguer than closed-ended questions, but do offer more freedom in their responses. Open-ended questions tend to provide more information, which also tends to be more illuminating, and do not include any researcher bias, only the answers that the respondents believe are important. This can lead to problems because respondents can answer however they choose using their own words, which can cause problems when analysing, interpreting, and comparing their responses. Another issue with open-ended questions is the verbosity effect. The verbosity effect is where some responses to a question are longer than others and are more complex. This makes some responses to a particular question more difficult to analyse and interpret than others, and is dependent on the respondent's interest or experience with the topic or phenomenon (Oppenheim, 2000; Peterson, 2000).

Constructing and Wording Questions

In order to obtain the important information from respondents, it was vital that the questionnaire was worded precisely in such a way that the potential questions were understood by the respondents and were appropriate to the study. Wording of potential questions could have influenced the respondents' answers and responses, and in turn could have an impact on the usefulness of the questionnaire. This meant that potential questions were constantly evaluated and revised every time they were constructed, finally being tested and re-evaluated before being formulated for pre-testing. Things like word difficulty, overly excessive terminology, question length, ambiguity, and readability were important considerations. It was understood that the potential questions should be brief and understandable because longer questions take longer to read, require more time and effort to read, may need to be re-read, and can be confusing. This also has an impact on the whole questionnaire as respondents may get tired and fatigued with a long questionnaire, and they may not agree to reply to the questionnaire at all. Respondents may also only partially read longer questions before answering them, which can impact the accuracy of the questionnaire. Only relevant potential questions, which did not contain irrelevant wording, were created and the possible answers to those questions were considered when creating potential questions. Irrelevant potential questions increase costs which are associated with the time required in creating, administrating, and answering irrelevant questions, and can lead to respondents refusing to reply to the questionnaire. Respondents themselves may perceive certain questions as irrelevant as well and was assessed through the pre-test. It was also understood

that repetition of potential questions with different wording were irrelevant because of redundancy (Peterson, 2000).

Ambiguity was also a consideration when creating potential questions which used wording with different meanings, slang words, jargon, and technical terminology. However, it was important to use certain wording that target respondents who associated themselves with a certain sub-culture would find easier to understand and relate to, meaning that sometimes ambiguous wording could also be important in certain circumstances. Again pre-testing was used to gauge this level of ambiguity. Specific wording was another consideration when constructing potential questions for the questionnaire. Specific wording was important when obtaining answers and responses from respondents because if specific questions were not asked then respondents cannot give specific answers. However, if the wording was too specific then there was a possibility that respondents may not answer the potential question. Overly general wording was also avoided because it can produce useless information. Therefore a balance between specific and general wording was important, and gauged using the pre-test. Finally it was important that the questionnaire remained objective and because of this was worded objectively. Biased potential questions infer that the answers were already known and the need for asking the question becomes redundant, they alienate the respondent, and create useless potential answers. Non-objective potential questions can also occur when the researcher does not disclose any information about the study so that the respondent does not have informed consent (Peterson, 2000).

Demographic Questions

It was understood that demographic questions provide information about the respondents, they can help with profiling respondents, they can be representative of the population, they can be useful when comparing groups, they can help to generalise the answers, and can help with the statistical analysis of the other answers in the questionnaire. However, it was decided demographic questions would not add any further depth or illuminate the study because the information demographic questions would produce, such as age, gender, occupation, marital status etc., were irrelevant and not important for the purpose of selecting information-rich respondents for participation in the main study. Also, due to the proposed small sampling size to be used, which required no statistical analysis or which was not selected to be representative of a population, demographic questions were deemed unnecessary (Peterson, 2000). It was understood that sample size can be determined by the number of comparative sub-groups required, usually a larger sub-group requires a bigger sample size, which reduces errors and creates statistical significance. However, sample accuracy was more important than sample size (Oppenheim, 2000).

Questionnaire Structure

In order to reduce questionnaire deficiencies the structure of the questionnaire was important. It was understood that ease of administration would decrease the amount of errors in the potential questions and answers, would facilitate the questionnaire's completion, and would help it to appear professional. The questionnaire should be structured in such a way that it would be easy to analyse and interpret. Also, the structure should not bias the potential answers and responses from respondents because of the order in which the potential questions are asked, this is called context effects (Peterson, 2000).

Questionnaire Components

Introductory Section

Questionnaires usually consist of introductory, substantive question, and classification sections. Introductory sections communicate information from the researcher to the respondent at the beginning of the questionnaire, can inspire and encourage respondents to take part, justify the research study, and provide instructions on how to complete the questionnaire (Oppenheim, 2000; Peterson, 2000). Introductions tend to encourage respondents to answer and respond to the questionnaire by adding weight to the importance of the purpose of the study, they provide information about the research, they can built a rapport with the respondent, they can reassure the respondent if they are in doubt about the time and effort needed to fill in the questionnaire, they can ask the respondent to be as candid as possible, and they can reassure the respondent of their anonymity and the researcher's confidentiality. As this was the section of the questionnaire which determined whether respondents would respond it was important to understand what was said and how it was said. This meant some information had to be disclosed about the study, which built a rapport with the respondent, and motivated them to respond. Also, the introduction section was used as a screening device, which filtered potential respondents that were interested with the topic and those who were not. It was understood that this may have led to self-selection bias, but this was not an issue because the questionnaire was not created to select a sample that was representative of a population or was not used to select large sample sizes. In fact it was very important as it screened potential respondents, that were information-rich, who believed that VGM was important to their video game engagement from potential respondents that did not, and were deemed as not crucial for selection in the main study (Peterson, 2000). As discussed earlier a short introductory sentence was used to explain the purpose of the questionnaire and to reassure the respondents of their anonymity, and the confidentiality of the author. However, a short statement was also added that asked for the contact details of respondents.

Substantive Section

The substantive section is the main body of the questionnaire which includes the potential questions that are vital to the objectives and purpose of the questionnaire. It was understood that this section should contain potential questions that are logically sequenced which reduced the time, and effort, in administration of questions, and answers, and reduced confusion for the respondent, which led to higher quality answers. The order of potential questions was important so that the order did not influence the answer to the next potential question asked, and simpler potential questions were placed before complex ones. Sometimes funnel questions are used, which are a set of potential questions that follow a sequence where the successive question in the set is more specific than the previous one. Funnel questions were used to channel the questioning from general to specific information and it maximised the quantity, and quality, of the information obtained from the answers. Also, it reduced answer bias and was used as a filter (Peterson, 2000). The main potential questions which asked the respondents of their opinions, perceptions, attitudes, and beliefs about the repetition of VGM, and the respondent's video game enjoyment, were placed here.

Classification Section

The classification section is usually the final section of the questionnaire. It consists of classification questions that can determine the respondent's socioeconomic and demographic characteristics. However, as it was stated earlier that these types of question were unnecessary for the purpose of the questionnaire no demographic or socioeconomic questions were asked. Instead questions that identified respondents were asked which were preceded by a short explanation introducing them. They were used to differentiate between respondents, were used for contact purposes, and were used to determine if respondents would be willing to participate in the follow-up main study. These questions were placed at the end because they required less effort to answer and tended to have low refusal rates from possibly fatigued, or time pressed, potential respondents. The classification section also normally contains a conclusion where the researcher acknowledges their appreciation to the respondents for completing the questionnaire (Oppenheim, 2000; Peterson, 2000). Identification questions were preceded by a short sentence that explained the purpose of this section before a final sentence that thanked the respondents were placed here.

Evaluating the Questionnaire

Evaluating the questionnaire meant that all the aspects of the questionnaire were taken into consideration including the question sequence, the aesthetic, the instructions, the format, wording, and flow of the questionnaire. All the questions were gauged with regards to the purpose of the

questionnaire and study, and any questions that did not provide this information were removed or fine-tuned. The proposed questionnaire was then pre-tested to further evaluate it (Peterson, 2000).

Pre-Test

Pre-testing used a combination of the author's supervisor and co-supervisor, who had some experience of questionnaire creation and administration, and a convenience sample, which included friends of the author that were video game players who perceived that VGM was important to their engagement, to evaluate and fine-tune the questionnaire. Due to the questionnaire's purpose it was decided that this would be sufficient because it was understood that a convenience sample that represents the target respondents would be the most insightful and consistent. The pre-test was personally administered and the convenience sample were questioned during, as think aloud, and after the completion, where the pre-test was discussed and notes were taken. The individuals in the convenience sample were probed on whether they understood the questions and why they answered questions in a certain way. They were asked to discuss any additional thoughts, questions, ideas, and any criticisms about the questionnaire, and its contents. The pre-test, and the feedback provided, were then discussed with my supervisor, and co-supervisor, who added some further feedback to help improve the reliability, and validity, of the questionnaire, and the methodology behind it (Oppenheim, 2000; Peterson, 2000).

The feedback from the convenience sample discussed that a combination of closed-ended and open ended potential questions worked best in obtaining information about repetition of VGM on video game enjoyment of the player. It was unnecessary to include separate potential questions about video game enjoyment or repetition of VGM, but instead have a potential question that included both. Also, the term "UNSURE" was replaced with "DON'T KNOW" to make understanding the answer alternatives easier for the potential respondents. A rating scale was considered but deemed to be unnecessary as it was more expensive to administer, analyse, and provided unnecessary information. It was discussed that a rating scale was not needed because a simple closed-ended potential question with an open-ended follow-up potential question would provide more information, would be more flexible, and would yield more information-rich responses. Finally the feedback discussed some ambiguity in the wording, but otherwise welcomed the lack of technical terminology and approved the rapport. A second draft was created from the feedback and discussed with my supervisor and co-supervisor.

The feedback received from my supervisor and co-supervisor discussed that instead of asking a screening question for the purpose of obtaining information-rich respondents a simple statement could be used as this would remove costs with answering and analysis, and if worded informally could

help build rapport with potential respondents. It was suggested that it would save time in checking respondents that answered the potential question if the statement explained that respondents only reply or complete the potential questionnaire if they believed it was important to do so. The feedback suggested that the author also disclose the length of the potential follow-up interviews so that the author was more upfront about the time and effort potentially involved with the main study. It was also suggested that a standard data protection explanation could be used. The feedback discussed the importance of form filling instructions which should have been included somewhere in the questionnaire. Finally the wording was discussed so that the potential questionnaire would be easy to read and complete.

A third draft was created that incorporated the feedback which was discussed with my supervisor one last time and feedback was given. Some final changes to the wording were suggested, however, it was recommended that one final potential question was added which asked respondents if they were willing to take part in the follow-up interviews. This was because it was easier to ask potential respondents in the questionnaire rather that emailing all the selected potential respondents about their availability, it would gauge the potential number of respondents who were available, and it would be easier to remove potential respondents who were unavailable during analysis. The final questionnaire was created and is shown below:

This short questionnaire was created to start a conversation regarding research into repetition of video game music on game enjoyment.

Your name and a contactable email address will be required so that you can be contacted, if selected, at a later date to ask if you will be willing to participate in a set of at least two informal interviews with a length of 45 minutes each. The purpose of these interviews will be to discuss your perspectives regarding repetition of video game music on your enjoyment of the player experience.

The contents of this questionnaire are absolutely confidential, and any information used in identifying the participant and their personal information will not be disclosed under any circumstances. All data obtained will follow data protection principles of the data protection act, which can be found at: https://www.gov.uk/data-protection.

If you believe that video game music is NOT important to the player experience please DO NOT fill in this questionnaire.

1). Does repetition of video game music affect your enjoyment of the player experience? (Please circle one answer).

YES NO DON'T KNOW

2). Why do you say this?

The following information is for identification purposes only…

3). What is your name?

4). Please give a contactable email address.

5). Are you willing to participate in the longer 45 minute sessions if we feel you can contribute further? (Please circle one answer).

YES NO DON'T KNOW

Thank you for your time and consideration.

Participant Selection

After the questionnaire was conducted a shortlist of participants was created that were important for the purpose of this study. For the purpose of selecting participants for the main study purposeful sampling was employed. The units of analysis were video game players who believed that VGM was important to their video game experience because it was understood that their perspectives would illuminate and focus the study. Also, only the criterion of video game players that believed VGM impacted their experience was used because it created more variation in the participants selected as it was understood that variation focused data collection, analysis, findings, and conclusions. It was understood that due to accuracy, meaning, and depth being the focus of the study, that sample size was small (Oppenheim, 2000; Patton, 2002).

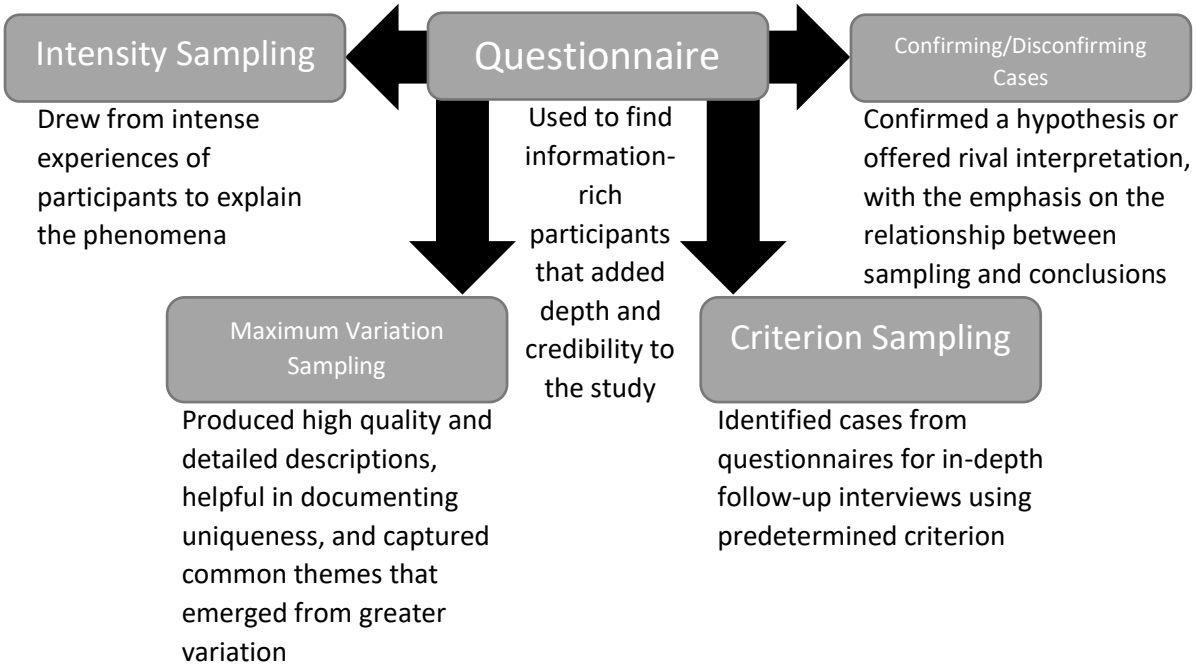

Figure 3. Participant Selection

A mixture of several different strategies were used for purposely selecting information-rich cases, these were grounded in the purpose of the inquiry (Figure 3). The different strategies used were (Patton, 2002):

- Intensity sampling uses the logic that information-rich cases manifest the phenomenon of repetition of VGM intensely, but it does not focus on unusual or extreme cases (which could distort the inquiry). It is used in heuristic inquiry, which draws from the intense personal experiences of the researcher and seeks a sample of equal intensity to explain the phenomenon repetition of VGM, and it is used here because of those reasons. A weakness of

intensity sampling is that it involves some prior knowledge of repetition of VGM from the researcher but that is also its strength as it is the responsibility of the researcher to judge individual cases from their own personal experiences;

- Maximum variation sampling attempts to capture, and describe, the central themes that emerge from greater variation because they capture the core experiences, and shared dimensions, of phenomena. In small sample sizes heterogeneity can be a problem because individual cases can be very different from each other. This strategy changes that apparent weakness into a strength because common themes that emerge from greater variation are particularly valuable and interesting. This strategy also produces high-quality and detailed descriptions of each case, which in turn are helpful in documenting uniqueness;
- Criterion sampling reviews and studies all cases that meet some criterion of importance, and can be used to identify cases for follow-up interviews. Although more useful for quality assurance and information management, it was used to filter information-rich cases that believed that VGM was important to their video game experience and to gauge if respondents were available for interviews. The strength of this strategy is that it is a quick and easy way to filter respondents, but its weakness is that some cases can be omitted from the study because they do not fit the criteria and may still be information-rich cases;
- Confirming or disconfirming cases are cases that confirm or disconfirm a hypothesis that has emerged from prior literature. Confirming cases are examples that fit and confirm to a hypothesis that has emerged from the literature review, adding depth, richness, and credibility. Disconfirming cases offer a rival interpretation and may be exceptions that disconfirm, and alter, the original hypothesis. This strategy's strength emphasises the relationship between sampling and research conclusions, and is particularly important because the author wished to find participants that either confirmed or disconfirmed the different hypotheses that repetition of VGM was a positive or a negative phenomenon which emerged from the previous literature. However, the weakness of this strategy is that cases must be carefully and thoughtfully selected because the sample determines what the researcher has to say about the hypothesis.

The reason for using these strategies was to select information-rich cases that explained the phenomenon of repetition of VGM with regards to video game enjoyment. It is proposed by the author that these information-rich cases would be a way to be open and clear about the limitations of this study. It was understood by the author that it would be the author's responsibility to discuss how the sample impacted the findings. These sampling strategies best fit the purpose and the orientation of

this study, the time, cost, the resources available, and the intellectual rigor of the author (Oppenheim, 2000; Patton, 2002).

Criterion sampling was used to find participants that believed that VGM was important to their video game experience. This filtered out any respondents that did not value VGM in video games and meant that only respondents who did believe that VGM was important to engagement answered the questionnaire. This was the only criterion used because the author believed that this would produce more information-rich cases and other criteria, such as demographic criteria, would not have added any additional depth or credibility to the study. This strategy was also used in conjunction with maximum variation sampling which produced more variation in information-rich respondents due to no other criteria being used and would not limit the study. 25 video game players responded to the questionnaire. Respondents that were unwilling to participate in the follow-up interviews of the main study were removed from the shortlist, this left 21 respondents. A mixture of confirming and disconfirming cases, and intensity sampling, strategies were used next to filter respondents.

Respondents that replied with answers that supported or did not support the previous literature were filtered using the confirming and disconfirming cases strategy. For example, if respondents turned-off the repeating VGM because it annoyed, bored, or irritated them it confirmed some of the previous literature that perceived repetition as a negative phenomenon, and respondents that believed that looped VGM with regards to player delay had a positive impact on their video game enjoyment disconfirmed the previous literature, which discussed looped VGM with regards to player delay as a negative phenomenon. The intensity sampling strategy was used on respondents to filter information-rich cases because it was perceived that respondents who did not have intense personal experiences with repetition of VGM and video game enjoyment should be removed from the study. For example, if a respondent discussed VGM with regards to their video game enjoyment but did not discuss repetition, the participant was removed from the study because they did not have any experience with repetition of VGM in video games. We will discuss the remaining respondents next (respondents' full questionnaire responses can be found in **APPENDIX A**, **Questionnaire Respondents' Answers**).

The author believed that Adam had an interesting perspective where he discussed the repetition of themes which added identity to a video game and discussed overfamiliarity as having an impact to his hedonic, and affective, enjoyment of a video game. This respondent was selected as a possible participant for the follow-up interviews.

Max discussed how possibly non-memorable melodies and variation impacted repetition of VGM. Also, the respondent discussed that his hedonic and cognitive video game enjoyment depended on what the player was doing in a scene where repetition distracted the player, possibly having an impact

on the flow state and his performance because of challenging moments in the video game. This respondent was selected as a possible participant for the main study.

Though short Tom A's response discussed VGM liking where the respondent believed that repetition was redundant in their hedonic enjoyment of video games. This respondent was selected because the author wanted to discuss repeated exposure to VGM and familiarity's impact on video game enjoyment with this respondent.

Louis was aware of repetition of VGM during certain boring scenes. It was difficult to gauge what bored this respondent during their engagement, it could be player delay, an issue with flow, uninteresting game events or player activity, or moments of idleness and inactivity in the video game. The author believed that it was worth discussing this with the respondent and the respondent was selected for the next phase of the study.

Midge explained that his hedonic, and affective, enjoyment were affected by repetition *in* and *of* VGM with regards to the scene. The respondent discussed emotional response to repetition and also discussed listener fatigue due to overfamiliarity. He also explained how VGM was implemented to be functional within the gameplay and that it was contextually dependant, which had an impact on his perspectives on repetition. In this context the functional role of repeating VGM increased his cognitive enjoyment and may have improved his competence, control, immersion, presence, suspension of disbelief, and identification with the hero. This respondent was selected because the author felt this respondent would offer depth and had intense personal experience of video games.

Although Mat gave an interesting answer he did not really have an opinion on repetition of VGM but did discuss VGM to some extent, even if the respondent acknowledged that the impact of VGM on their cognitive enjoyment of video games was negligible. Due to the respondent not having an intense personal experience with repetition of VGM he was not selected for the follow-up interviews.

Alice was one of the few that would actually turn-off the VGM if it was overly repetitive. This respondent was selected for the follow-up interviews due to the respondent supporting the perspectives of some of the authors in the previous literature.

Joni explained that VGM liking was very important with regards to repetition of VGM. In a similar way to Tom A the author was intrigued whether familiarity and repeated exposure to VGM would have an impact on Joni's enjoyment of a video game. Due to these answers this respondent was selected for the main study.

Tom W's answer was interesting because he was discussing overfamiliarity with leitmotif due to repeated exposure and scene appropriateness with regards to VGM. It was believed by the author

that this respondent offered an alternative perspective on leitmotif but simultaneously discussed satiation. This respondent had some interesting points about repetition of VGM with regards to implementation of VGM and was selected as a participant.

Vlad had a negative perspective of repetition of VGM which supported the previous literature. He believed that repetition of VGM had an impact on hedonic and affective enjoyment as well as on engagement, which could negatively impact immersion and motivation, and argued that the video game itself could feel repetitive due to repetition of VGM. He also discussed that overfamiliarity caused listener fatigue and satiation, and that had an impact on his hedonic, and affective, enjoyment of the video game. Due to these points the respondent was selected for participation in the main study.

Jimmy seemed to feel very passionately about repetition of VGM and had intense personal experience with it. The respondent discussed repetition of VGM affecting his hedonic, eudaimonic, affective, cognitive, and behavioural enjoyment positively with regards to scene appropriate leitmotif. In this context repetition of VGM acted as a form of feedback for the player, suspended his disbelief, improved his immersion, and also communicated meaning through leitmotif. He also discussed repeated exposure of VGM and familiarity with regards to liking, and preference. However, the respondent also discussed the negative impact of repeated VGM on his hedonic, affective, and cognitive enjoyment of video games with regards to player delay, repetitive game events and player activity (scene), and possibly flow state due to boredom. Here the respondent discussed overfamiliarity, satiation, and listener fatigue. The respondent offered alternative approaches and techniques to reduce repetition of VGM in these situations, such as the use of variation and adaptive/dynamic music. He explained that his affective and cognitive enjoyment with regards to repetition of VGM was contextually dependant, was appropriate to the genre of the video game, and how it was implemented. This was a very interesting response with many themes that emerged from the questionnaire answers supporting the previous literature. It was also interesting to see that this respondent had both a positive and negative perspective of repetition of VGM. This respondent was selected for participation in the follow-up interviews.

Ashley discussed repetition of VGM with regards to scene appropriateness and gave an example of the use of repetition of VGM with regards to leitmotif aiding with the goals of the video game, and discussed how repetition of VGM motivated the player. He also discussed the use of silence and how VGM should be implemented. The respondent discussed that if VGM was not appropriate to the game events and player activity (scene) then it could have a negative impact on motivation, and engagement, of the player. This respondent was selected to participate because of several interesting

points that supported the previous literature and because it seemed he had some experience with repetition of VGM with regards to cognitive video game enjoyment.

Tom P discussed that repetition of VGM with regards to cognitive video game enjoyment depended on whether the VGM was appropriate to the scene and genre. He also discussed feedback with regards to leitmotif and the communication of meaning by repetition of VGM. The respondent had a different perspective on the use of repetition of VGM in smaller games where he explained it had an impact on his video game hedonic and affective enjoyment due to overfamiliarity. This respondent was selected for the main study.

There was a little bit of confusion with Aaron's reply as he discussed music genre and appropriateness. However, this could be interpreted as VGM appropriateness with regards to video game genre. The respondent discussed how repetition of VGM acted as leitmotif, how it could focus the player, provided feedback to the player, how it communicated meaning, and was used as a form of foreshadowing. The respondent also discussed leitmotif and continuity with regards to repetition of VGM. He also explained that overfamiliarity had an impact on hedonic and affective video game enjoyment, and gave an example of licensed music playlists. This respondent seemed to have personal experience with repetition of VGM and was quite passionate in his reply, he was selected for the next phase of the study.

Jack discussed VGM complexity with regards to repetition of VGM. Unfortunately the respondent focussed on immersion, however, the previous literature suggested a relationship between immersion and enjoyment. This respondent was selected for the follow-up interviews because of his answer with regards to VGM complexity.

Simon discussed the role and function of VGM, that VGM should be scene and game appropriate, and that VGM should be used to create atmosphere, and mood, which was very interesting. However, he did not discuss repetition of VGM in his reply and was not selected because of this.

Immersion was discussed in Kieron's reply and as explained earlier there was some evidence to support that immersion, and enjoyment, have a relationship in the previous literature. The respondent believed that repetition of VGM had a negative impact on their engagement, however, the respondent explained that if the VGM was liked, repetition of VGM would improve their immersion but that engagement was subjective. This respondents perspectives offered some insight into liking VGM and could be have been explored more with regards to familiarity, and supported some of the perspectives in the previous literature. This respondent was selected for participation in the main study.

Daniel discussed overfamiliarity with regards to listener fatigue and satiation. He was also one of the few respondents that replied with an answer which supported the previous literature when it came to turning-off the repeating VGM. He also discussed the use of user-selected playlists as an alternative to repetition of VGM. Due to these answers this respondent was selected for the next stage of the study.

Adam H discussed the positive use of repetition of VGM that made VGM catchy in retro games, which supported some of the previous literature. He also discussed that this experience was different in modern games where the implementation of looped VGM had a negative impact on his hedonic, affective, and cognitive video game enjoyment if not done well. This was an interesting perspective and the author wanted to probe this respondent for further clarification. Therefore this respondent was selected for the follow-up interviews.

Christophe discussed complexity of looped VGM which had a negative impact on his hedonic video game enjoyment. Unfortunately there was some confusion over what the respondent said next and was not selected for participation in the main study due to this.

Ben believed that looped VGM that constantly played throughout his engagement with a video game had a negative impact on his hedonic, affective, and cognitive video game enjoyment. However, his perception was more positive with regards to variations of leitmotif that were appropriate to the scene and continuity, which provided him with feedback. This respondent supported what was discussed in the previous literature and was selected to participate in the follow-up interviews of the main study.

It is just worth discussing some respondents who were unable to participate in the follow-up interviews at this stage because these respondents were information-rich cases and the author would have liked to include them but could not. Rumen had a very negative perspective of repetition and would terminate his engagement with the actual video game due to repetition of VGM. Matt discussed VGM quality, its implementation, and appropriateness. He had a positive perspective of repetition of VGM if the VGM was designed and functioned well within video games. Constantine discussed that looping had an impact on his hedonic, affective, and cognitive enjoyment of a video game due to overfamiliarity. However, he also explained that if the looped VGM used compositional techniques that diminished or concealed that repetition his hedonic, affective, and cognitive video game enjoyment was improved greatly, and his gratification also increased. All these respondents would have added depth and credibility to the study, and would have helped to explain the phenomenon of repetition of VGM, but were removed from the study because they were not willing to participate in the follow-up interviews of the main study for one reason or another.

This left 18 respondents that were selected for the main study and were contacted via email that they had included in the questionnaire. Only 12 respondents replied that they were available for the follow-up interviews. The author tried to contact the remaining 6 respondents specifying his flexibility with conducting the interviews but either did not receive a reply, was told that they were unavailable, or was notified that they were unwilling to participate. The author felt that he did not want to harass the remaining 6 respondents any further and decided that 12 information-rich cases would be enough to fit the purpose, and orientation, of the study. This amount was also manageable with the time constraints and resources available to the author.

Design

Design Overview

After the questionnaire had determined the participants a pilot study was undertaken because the author wanted to gauge what would be the best strategy for interviewing the participants in the main study. It was decided to use the ambiguous term of enjoyment with all the participants in all the interviews because it was understood that participants would understand the term as it was not overly academic, technical, and was flexible enough for them to discuss it with the author (Peterson, 2000). The main study was divided into two interviews which followed-up the participants' answers in the questionnaire (Figure 4). Qualitative open-ended interviewing was used to find out perspectives that could not be directly observed. Feelings, thoughts, and meanings can emerge from interviewing because it allows inquiry into other people's inner perspectives. This process began with the assumption that these perspectives were meaningful, knowable, and were able to be made explicit (Patton, 2002).

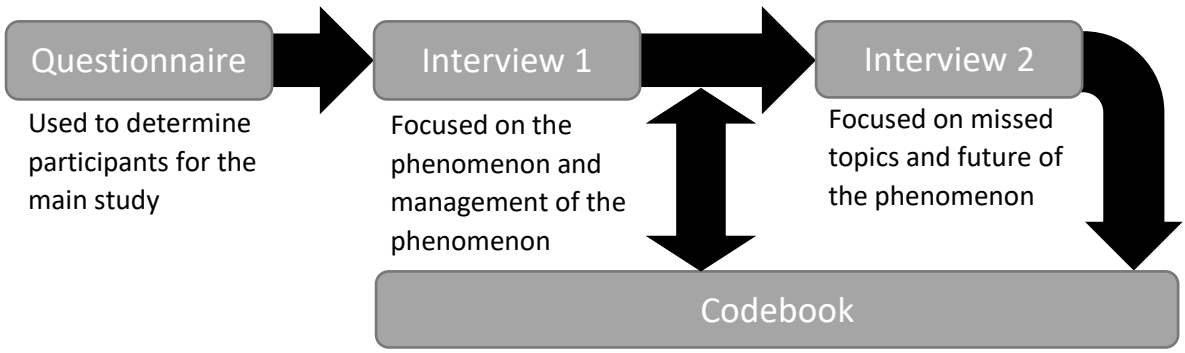

Figure 4. Design of Study

Study 1 focused on the phenomenon of repetition of VGM and its impact on enjoyment, with enjoyment being a measurement of engagement. It also reviewed the approaches and techniques used to manage the phenomenon. Some interesting data emerged from the organisation of study 1

about the positive use of leitmotif with regards to the repetition of VGM and video game enjoyment which the author perceived as important to the purpose of the study, and was pursued by the author. Study 2 offered the participants an opportunity to confirm, verify, and extend their perspectives about the positive use of leitmotif, and VGM repetition, in study 1, which allowed them to contribute to the study (Patton, 2002). The important topic of music preference tool playlists was accidentally missed out in study 1 and study 2 offered the opportunity for the author to include the topic. Study 2 also discussed the future role and function of repetition of VGM in video games. After a codebook was developed from the data obtained in both studies with codes based on the research from the previous literature and participant perspectives, the interpretation phase began using the tradition of heuristic inquiry. The decision to use this particular design depended on the purpose of the study, the audience, time and resources available, and the interests, abilities, and biases of the author. The design was emergent and flexible because the author understood that this permitted exploration of the phenomenon under study. The author believed that they had justified a design and method that was appropriate, productive, and useful in this situation, which would also hold up to the critique and judgement of peer review (Burns, 2000; Clough & Nutbrown, 2007; Creswell, 2014; Flick, 2014).

Materials and Procedure

Pilot Study

A pilot interview was undertaken to better understand the process where it was understood that there are different approaches to open-ended interviewing. An informal conversational interview was used in this pilot interview because it had low costs in terms of the time and effort used to create it, it was used to quickly build an understanding of the issues surrounding the topic of interest, and it was used to better understand the process behind interviewing. Informal conversational interviews use spontaneous generation of questions which emerge from the natural flow of a conversation with the respondent. It is a very open-ended approach, spontaneous, and offers a lot of flexibility because there are no guidelines or standardised questions that the researcher must follow. However, while it remains focused by the purpose of the study, and the previous literature, it can be difficult to obtain the relevant information and can lead to interviewer bias, it can also be difficult to analyse (Patton, 2002). The pilot interview was conducted with a participant that was selected from respondents to the questionnaire. The participant was selected because they were information-rich and they were available for the interview, but were unsure if they were confident enough to take part in the main study interviews. After being reassured that the author was also nervous about the process the participant agreed to the pilot interview. All of the interviews were conducted using Skype and recorded using MP3 Skype Recorder to permit the author to be more attentive during the interviews, this was fully explained to the participant. Several themes emerged from the interview which were

similar to the previous literature and helped form the basis of the interviews in the main study. Several themes that emerged included the negative impacts of VGM repetition such as:

- Repetition of VGM could be distracting and irritating due to overfamiliarity, and had an impact on the participant's enjoyment with regards to engagement;
- VGM repetition sometimes was intrusive, where it broke the flow of the game, which impacted the participant's engagement.

Positive uses of VGM repetition where discussed such as:

- The use of leitmotif with regards to scene and genre appropriation, which added to the enjoyment of a video game;
- The functional use of leitmotif communicated meaning to the participant and provided feedback to the scene due to familiarity, however, if leitmotif was not used sparingly, the VGM lost its meaning but still provided the participant with motivation;
- The use of themes were expected, which added continuity to a video game and unity across a franchise, were discussed.

Several approaches and techniques that managed VGM repetition were discussed:

- The participant discussed that VGM should be in the background, which helped diminish repetition;
- User-selected playlists were discussed with regards to being used only when not liked VGM repeated;
- The participant said that if the VGM was implemented well then repetition of VGM was not a problem even if the music was not liked;
- With regards to retro games repetition was welcomed as it was appropriate to the aesthetic of those types of video games, was nostalgic and iconic, and was understood as being dependant on technological constraints.

However, it was decided that the pilot interview lacked some structure and, as expected, some of the information was irrelevant. It was difficult to analyse and would have increased the cost with regards to time, and effort, if deployed in the main study. These factors meant that ultimately this approach was not used in the main study.

Study 1

Before the interview took place a purpose statement was sent to all the participants that agreed to the interviews. It was decided that full disclosure would be given to the participants about the purpose

of the study and the research it would generate. This was done because the author wanted the participants to become involved with the study in line with the heuristic worldview and the author believed that they should be transparent with participants which helped rapport, and that transparency with participants meant that the author was upfront about their own personal bias. Any additional questions that the participants had about the study were discussed prior to the interview with the participant which included questions on how the data would be used. The following is the purpose statement sent to selected participants:

The Affect of Looping and Repetition of Video game music on Engagement

Purpose Statement

The focus of this research is on the phenomena of looping and repetition of video game music (VGM) on engagement, where the subjective player experience of game enjoyment is a measure of player engagement.

Approaches and techniques to looping and repetition are important in researching with regards to enjoyment and engagement. Due to the interactive nature of video games it is difficult to predict the amount of time the player will remain in a scene. A scene is usually made up of game events and player activity. Looping the VGM is a common technique used to solve this issue. This can lead to repetition of the looped VGM if the player spends long periods of time in a scene.

Previous theoretical VGM research mainly focuses on concealing and reducing repetition with regards to game enjoyment, where looping and repetition of VGM is regarded as negative phenomena. Empirical research outside of the domain of VGM suggests that repetition of musical compositions increases the listener enjoyment of those musical compositions, where repetition is regarded a positive phenomenon. Unfortunately there is no empirical research into the impacts of looping and repetition of VGM on game enjoyment, where game enjoyment is a measure of player engagement. This study hopes to change that, both for theoretical and practical considerations, and to highlight player perspectives of the phenomena.

Confidentiality

The contents of the interviews are absolutely confidential, and any information used in identifying the participant and their personal information will not be disclosed under any circumstances. All data obtained will follow data protection principles of the data protection act, which can be found at: https://www.gov.uk/data-protection.

For the main study a general interview guide approach was used to ask open-ended questions of the participants (Figure 5). The general interview guide served as a checklist and outlined a set of issues that were explored. This approach served to highlight relevant topics, and made sure that the topics were covered. It provided topics or subject areas within which the author was free to explore, probe, and ask questions that illuminated the phenomenon. This allowed the author to build a conversational style while keeping the focus of the interview. It allowed the author to word questions spontaneously and to build the conversation within a particular subject area. The advantage of this approach is that it was more efficient with the limited time available, it was more systematic and comprehensive when

interviewing different people because it outlined the issues to be explored in advance, it allowed individual perspectives and experiences to emerge, and allowed the author to ask questions in the same order to all the participants. It was understood that the guide could have been developed in more or less detail depending on the specification of important issues and offered the author flexibility if topics emerged during an interview (Patton, 2002). For the main study less detail was preferred by the author because there was some ambiguity in the definitions and understanding of core concepts in the culture that surrounds video games. The author focused on these categories in the guide which were developed from the prior literature and the pilot interview:

- *The player experience;*
- *Familiarity and music;*
- *Leitmotif and repetition;*
- *Approaches and techniques with regards to VGM repetition;*
- *Future of VGM repetition.*

Ultimately, the guide offered the author a framework which was used to develop, sequence, and pursue questions in greater depth. This framework also kept the focus of the interview because subjects that were not covered in the framework were avoided or the interview was re-focused if the interview went in a different direction (Patton, 2002).

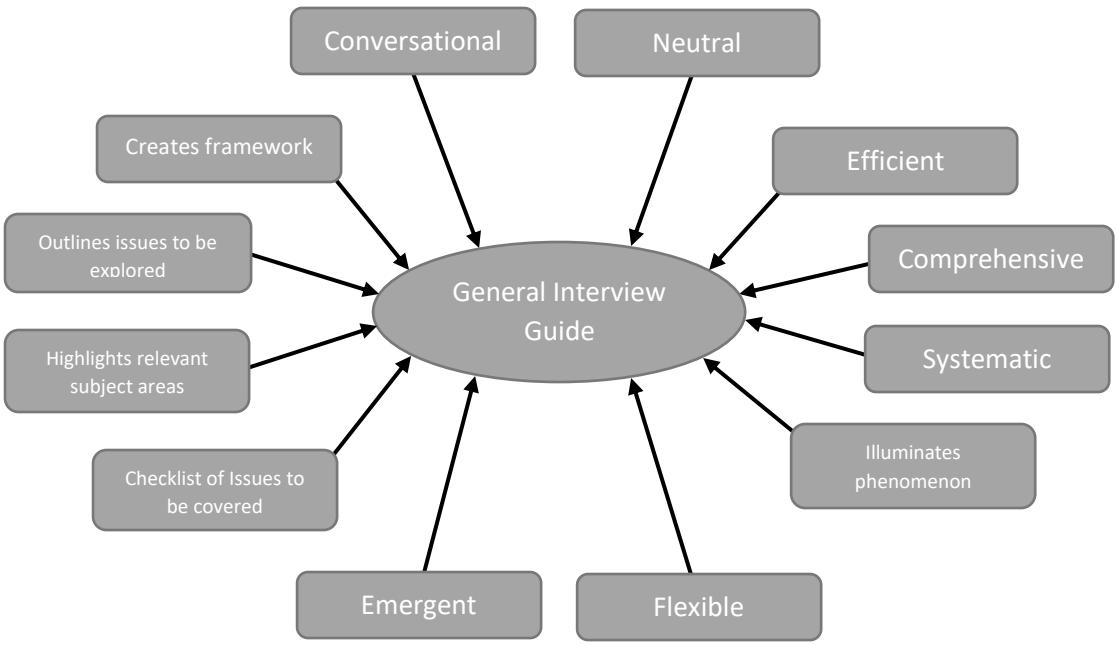

Figure 5. The General Interview Guide

The general interview guide incorporated experience and behaviour questions, opinions and values questions, feelings questions, and knowledge questions (Figure 6). Experience and behaviour questions are about what the participants do, or have done, and their aim was to obtain experiences, and behaviour, which would have been observable if the author had been present. Opinions and values questions aimed to understand what the cognitive, and interpretative, processes of participants were with regards to opinions, judgements, and values. The answers to these questions told the author what participants were thinking about experiences or phenomena. Feelings questions distinguished emotional responses from cognitive ones, and their aim was to obtain feelings, and emotions, from participants. Answers to these types of questions explored the affective dimension of the phenomenon experienced, and they were different from opinions in that they focused on feelings rather than on what the participants thought. Knowledge questions inquired about the factual information that participants might have known, or what they thought they might have known (Patton, 2002).

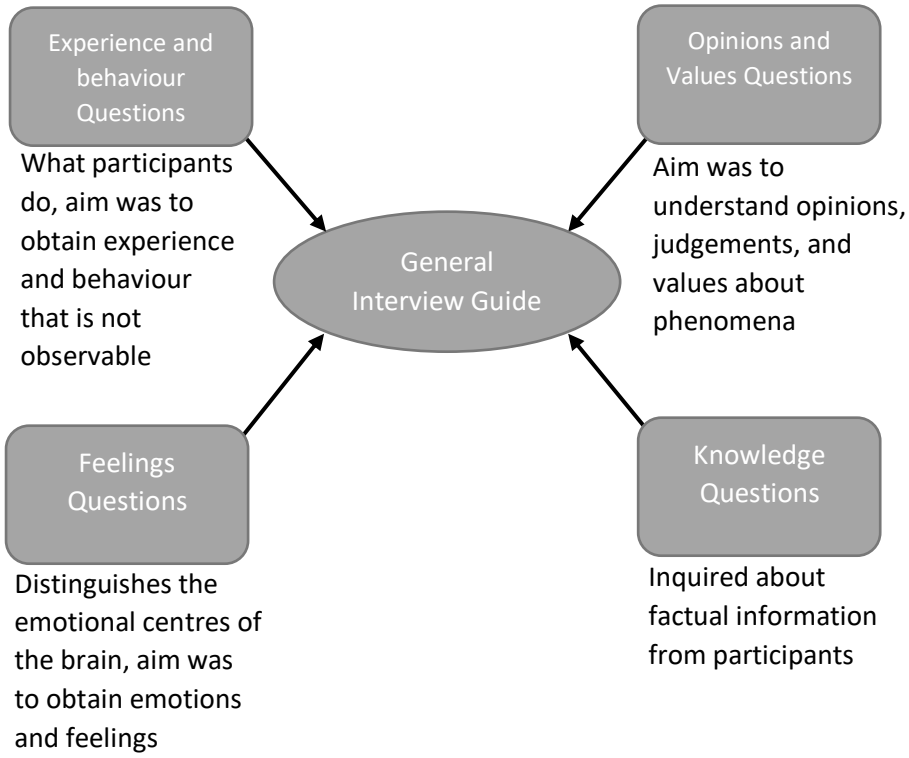

Figure 6. Question Types

Questions were sequenced to allow the author and participants flexibility, and to allow for emergent concepts to be obtained (Figure 7). An opening statement was used to explain the overall purpose of the interview to the participants. Preposition questions that focused on important participant experiences were used because the author believed that they increased the richness and depth of the responses. These kinds of questions also made the participant more comfortable which helped the

naturalness of the inquiry to flow. This also established rapport with the participants in a way that did not diminish or undermine the author's neutrality. Prefatory questions and announcements were used to facilitate responses from participants. This served the purpose of informing participants to the nature of the next question, it directed their focus, gave them a little time to organise their thoughts before responding, and also helped to smooth out the flow of the interview. Probes and follow-up questions were used to deepen the response to a question, added more richness and depth to the responses, they helped the participants focus and they guided them on important concepts, and they were useful to the author by providing control to the direction, and flow, of the interview. It is understood by the author that it was their responsibility to maintain awareness of how the interview was flowing, how the participant reacted and answer, and provided reinforcement, and helpful, feedback to the participants, obtaining high-quality and desired responses from them. This helped the author distinguish what was appropriate, relevant, and useful. A final (closing) question was used to allow the participant to have the final say and conclude the interview (Patton, 2002).

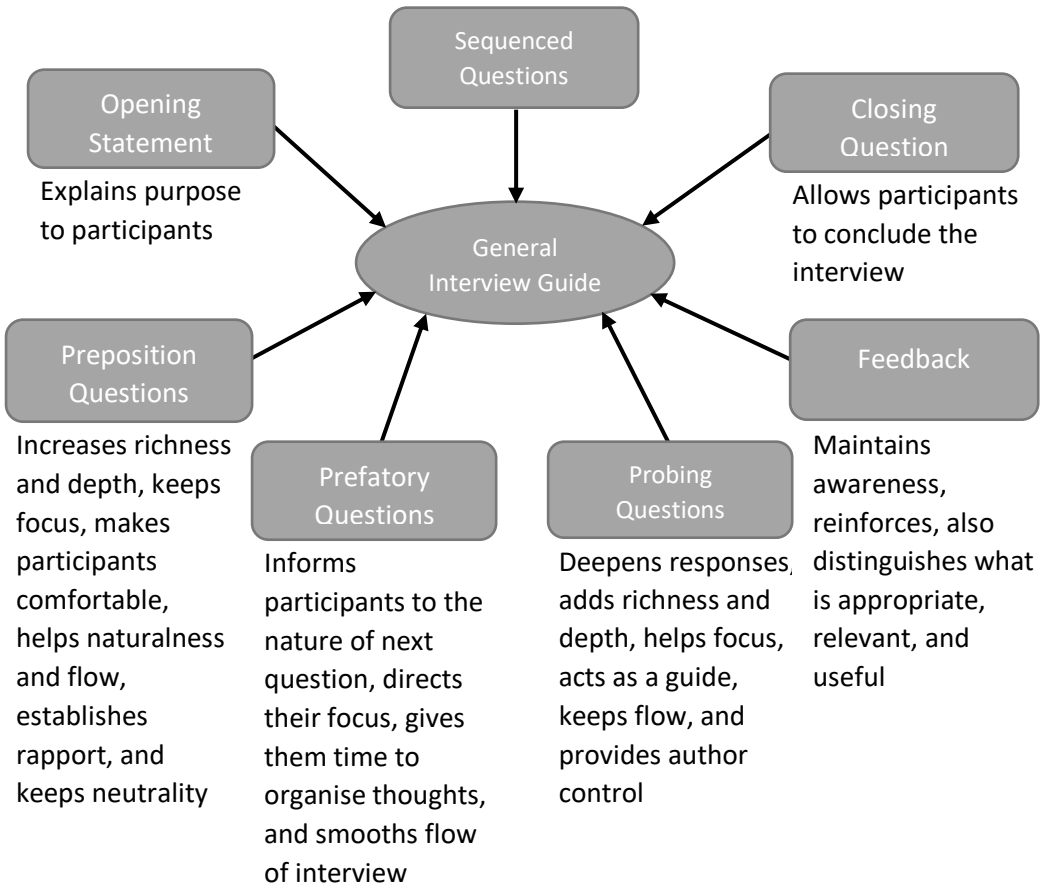

Figure 7. Rapport and Neutrality

Using this as a guide a general interview guide was developed that used the above categories, the pilot interview, the experience of the author with the topic of interest, and the previous literature to create specific topics that were important for discussion:

The player experience

- Engagement
  - Video game enjoyment as a measure of engagement
    - VGM repetition's impact on video game enjoyment
      - Repetition as a negative phenomenon
        - Irritate, annoy, distract, disconnect, contradict, disturb, bore, disgust, non-pleasurable, intrusive, frustrate, disengage, breaks flow, and indifferent

Familiarity and music

- Familiarity with VGM
  - Liking increases with familiarity
  - Subjective complexity with music decreases with familiarity
  - Overfamiliarity leads to satiation and listener fatigue

Leitmotif and repetition

- Leitmotif
  - Repetition as a positive phenomenon
    - Acts as feedback to the player
    - Communication of meaning
      - Aids and guides the player
      - Aims and goals of the video game
      - Focuses player
      - Helps with the learning curve of the video game
      - Identifies settings, characters, narrative, and mood
    - Appropriate VGM
      - Scene (game events and player activity)
      - VGM/video game genre
    - VGM theme
      - Unity across a franchise
      - Continuity throughout the video game
      - Can make the video game iconic
      - Adds identity to the video game
      - Variation of a theme

Approaches and Techniques with regards to VGM repetition

- Approaches and techniques used to reduce, conceal, and remove VGM repetition
    - Adaptive/dynamic music (interactive music)
    - VGM should be heard only in the background
        - Catchiness of VGM
        - Non-memorable melodies
    - VGM interspersed with silence
    - Playlists as an alternative
        - User-selected
            - Strategic use
        - Licensed music
        - Music preference tools
    - Procedural audio
    - VGM as a form of foreshadowing
    - Diegetic/non-diegetic music
- Interactivity of video games
    - VGM is listened to in different way
    - Contextually dependant
    - Player agency
- Functionality of VGM
- Implementation of VGM
- Multiplayer and single player differences with regards to VGM repetition
- Retro video games and looping
    - Nostalgia
    - Expectation for retro aesthetic

Future of VGM repetition

- Future of VGM repetition
- Role of VGM repetition in the future

Notes were taken during interviews, however, because the interview was recorded the notes allowed the author to concentrate on formulating new questions, allowed the author to maintain pace of the interview, they kept the interview relevant and focused, and facilitated analysis (Patton, 2002).

Study 2

Again, a general interview guide approach was used to ask open-ended questions of the participants. As in study 1 the general interview guide included experience and behaviour questions, opinions and values questions, feelings questions, and knowledge questions. As a codebook was developed earlier, preposition questions were derived from it and were used in this study to increase richness and depth. Prefatory questions and announcements were used in a similar way to study 1 to facilitate responses from the participants, where they continued to focus the interview and helped to guide the flow of

the interview. Probes and follow-up questions were used in a similar way to study 1 where they increased the depth and richness, helped participants focus, and helped the author to control the interviews. Finally, a closing question allowed the participants to add anything more and to conclude the interview, as with study 1. Interviews were audio recorded and notes taken as in study 1 (Patton, 2002).

Analysis

Findings Overview

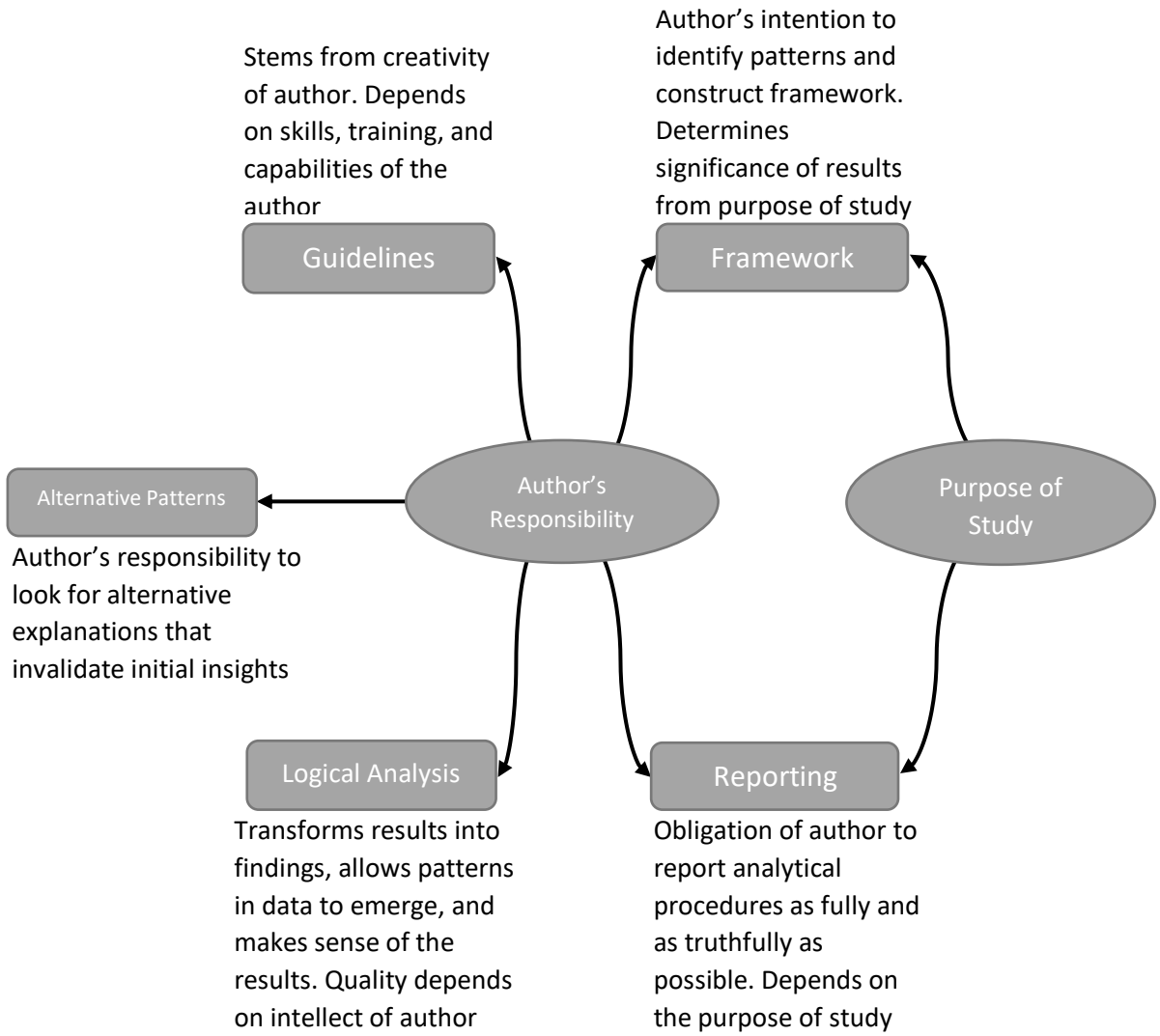

Figure 8. Transforming the Results into Findings

Logical analysis transformed the results into findings and made sense of the results (Figure 8). It was understood that the quality of the transformation depended on the intellect of the author. Logical analysis allowed patterns in the data to emerge. It was the author's intention to identify patterns,

construct a framework of the essence of the results, and determine significance of the results from the purpose of the study. Applying guidelines for this analysis stemmed from the creativity of the author, they depended on the skills, training, and capabilities of the author. The author had an obligation to report analytical procedures and processes as fully, and as truthfully, as possible (Burns, 2000; Clough & Nutbrown, 2007; Creswell, 2014; Flick, 2014; Patton, 2002). The extent of this reporting depended on the purpose of the study. Two sources were used in organising the analysis: first, concepts that were formulated during the conceptual, and design, phases of the inquiry using prior literature and; second, emergent analytical insights and interpretations that emerged during the data collection phase. It was the responsibility of the author to look for alternative patterns and explanations that may have invalidated the initial insights that emerged from the findings. A descriptive analytical framework was developed using thick description from the interview guide approach, and was grouped by themes identified from the codebook, previous literature, and emergent patterns (Patton, 2002).

Study 1

Transcribing

Out of the eleven respondents that took part in the main study one participant was not transcribed because the author decided that the interview was not focused enough on the topic of interest. Unfortunately, the interview was very difficult to control because the participant frequently discussed non-relevant topics and tended to discuss them at length. Several attempts were made during the interview to control and re-focus the participant but the interview was quite chaotic. This increased the duration of the interview, which was on average forty-five minutes in length, to over an hour and thirty minutes, which was deemed as overly long by the author. This left only ten interviews that were transcribed in study 1. The recorded interviews were transcribed by the author for study 1 using Express Scribe Transcription Software. It was understood by the author that transcribing acted as a point of transition between data collection and analysis (Patton, 2002). The interviews in study 1 were mostly transcribed somewhere in-between verbatim and intelligent verbatim where certain speech disfluencies were omitted such as “err”, “erm”, and “um”, while others such as “uh-huh” were kept because they were usually a reply or a form of acknowledgement. Pauses, hesitations, some repetition of words, and unfinished sentences were not transcribed. Some editing was done to correct grammar but laughter was kept in the transcriptions. This was done to help with the flow of the transcriptions and to be as transparent as possible in presenting the transcriptions to the audience. Also, keeping the interviews as intact as possible helped in the analysis phase of the study (Patton 2002).

Organisation

Organising the data helped the author get a sense of the results and of the quality of the information collected. As was expected from qualitative, open-ended, interviews a lot of data was generated from the interviews and before any analysis could have taken place the data needed to be organised in such a way that it made sense (Patton, 2002). Firstly, the interview transcriptions were organised by individual participants where important areas of the interviews were highlighted for each participant. For example, only areas that discussed the topics from the general interview guide were highlighted and discussion that built a rapport with participants were not. Then the data was organised by categories using the categories from the general interview guide: *the player experience*, *familiarity and music*, *leitmotif and repetition*, and *approaches and techniques with regards to VGM repetition*. An additional category was developed called *closing comments*, which gave the participants an opportunity to add anything they perceived to be important about VGM repetition and video game enjoyment. These became the start of main categories for the data and for content analysis of the codebook, which was to be developed from the data. Content analysis is a form of data reduction and made sense of the results by identifying core consistencies, and meanings called patterns or themes (Patton, 2002).

This approach placed all the participants' answers to questions about topics asked in a category into one place. For example, the answers given by a participant to questions from the general interview guide regarding the topics of engagement, enjoyment, and repetition were placed in *the player experience* category. This was done for all the participants and placed together in one document, which was organised as *the player experience*. This was done for all the categories so that the participants' answers to questions about topics in categories could be compared easily for themes and patterns that emerged, and was one of the reasons that a general interview guide was used in the data collection phase. For example, if several participants discussed repetition of VGM as a negative phenomenon with regards to their video game enjoyment, such as if VGM repetition was annoying or boring, then this pattern could be easily identified and their answers could easily be compared for analysis. The next phase of organising the data was to remove researcher, and participant, interruptions which created full sentences, and paragraphs, of dialogue and acted as a simple form of data reduction. Again, this helped with the flow of the transcriptions and helped to present the findings in a clear, and transparent, way. Finally, key areas were highlighted that focused on topics as the final phase in organisation of the data for study 1. For example, phrases such as "sort of", "I guess", "you know", words such as "like", "maybe", parts of the discussion that continued the dialogue such as "let's start", "we'll move on now", and "I get you" were not highlighted. This helped later with the analysis and interpretation phase.

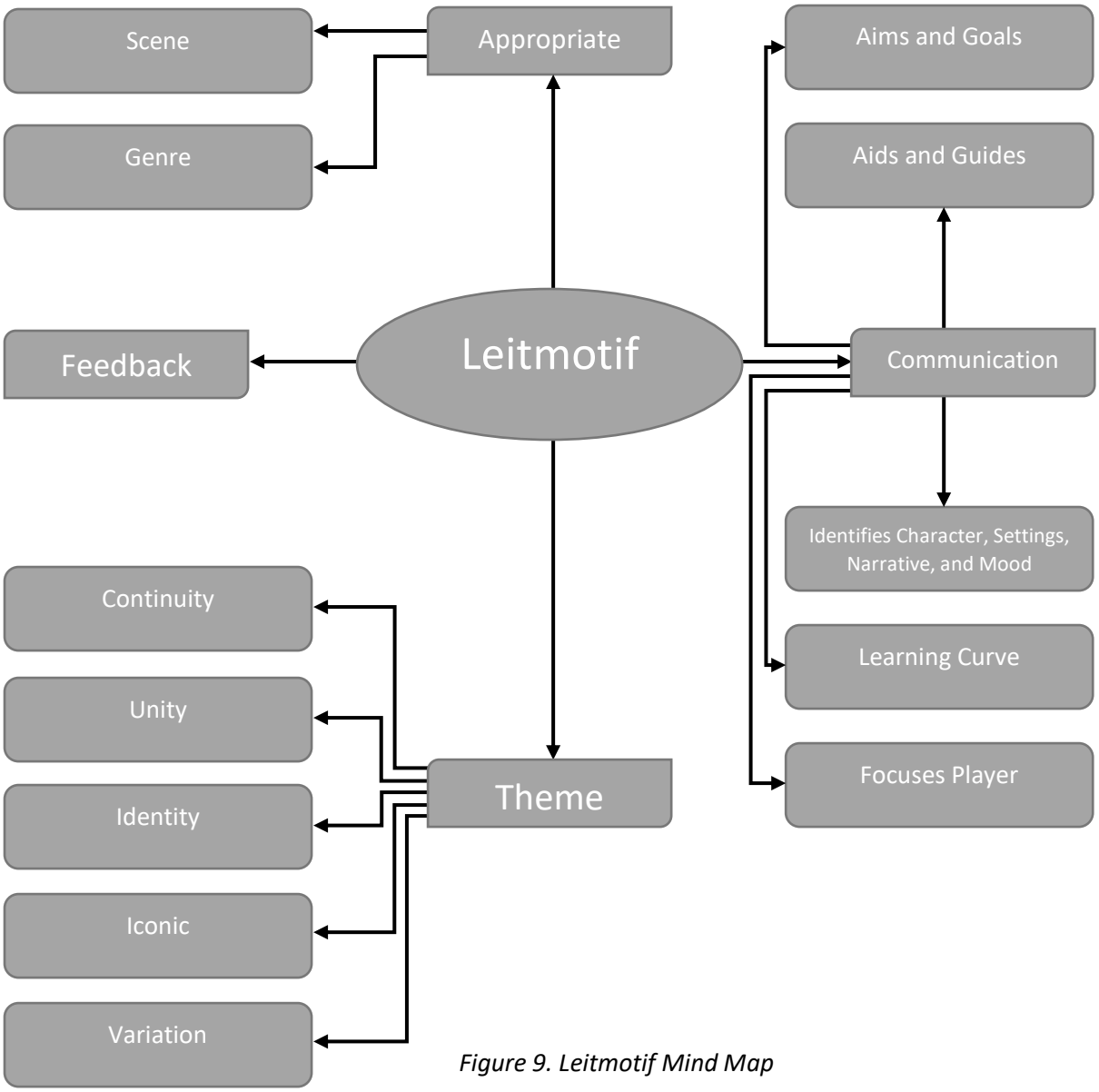

Figure 9. Leitmotif Mind Map

Due to the use of the general interview guide some important and interesting information emerged about the positive use of leitmotif with regards to the phenomenon of VGM repetition in the data organisation of study 1. It was decided at this stage to pursue this emergent information because it was understood that emergent data was an important characteristic of qualitative studies. The tradition of heuristic inquiry guided this decision because of the author's perspectives on the positive use of VGM repetition in video games (see Bias and Credibility), and that the author intended to involve the participants in the study. Finally a pragmatic approach was used because it was believed that other researchers and VGM producers would benefit from the perspectives of players about the positive aspect of VGM repetition (Patton, 2002). A mind map was created from the category of *leitmotif and repetition*, which included all the relevant topics from the general interview guide. This mind map served as a template for the next phase (Figure 9). Mind maps were created for each participant with regards to *leitmotif and repetition*, which included all the relevant topics discussed

with the participant. These were compared against the template and any missed topics were recorded for each individual participant.

Study 2

Transcribing

For Study 2 only seven participants returned to have a second interview. Due to the second interviews having a shorter duration of around twenty minutes, the transcription process was shorter and took less time. The interviews in study 2 were transcribed in exactly the same way as study 1 to help with the flow and transparency of the transcriptions when presented to the audience, and helped with the analysis phase of the study (Patton, 2002).

Organisation

Even though the interviews in study 2 were shorter than in study 1 the information generated still needed to be organised so that it made sense before the analysis phase (Patton, 2002). As with study 1, the interview transcriptions of study 2 were organised by individual participants where the important issues of the interview were highlighted for each participant. Once this was done, the data was organised by the categories of the general interview guide. However, this time only the categories of *leitmotif and repetition*, *approaches and techniques with regards to VGM repetition*, *future of VGM repetition*, and *closing comments* were used. The category of *leitmotif and repetition* was used because the interview in study 2 purposely discussed topics from that category, which were missed in study 1. The category of *approaches and techniques with regards to VGM repetition* was used because the topic of music preference tool playlists was accidentally missed out in study 1, and completed that category's topics. The category of *future of VGM repetition* was used, which discussed the topic of the future role of VGM repetition with participants. Finally, the category of *closing comments* was used in the same way as study 1. With the addition of the categories in study 1, these categories completed the categories for the data and content analysis of the codebook.

Therefore, the main categories for the codebook were: *the player experience*; *familiarity and music*; *leitmotif and repetition*; *approaches and techniques with regards to VGM repetition*; *future of VGM repetition*; and *closing comments*. As with study 1, this placed all the respondents' discussions about topics to the categories of study 2 in one place, which made analysis and comparison of the data easier, systematic, and methodical. The next phase was, again, to remove researcher and participant interruptions in exactly the same way as study 1, which reduced the data and created full sentences, and paragraphs, of dialogue. The last phase in organising the data in study 2 was to highlight key areas that focused on topics, which helped in the interpretation phase, as was done in study 1. With the

organisation of the data complete, the study could move onto the next part of the analysis phase, which was coding.

Studies 1 and 2

Coding

Coding determined what was significant from the data and was developed using open coding, which emphasised the importance of being open to the data, and was hand coded (Patton, 2002). It was understood that hand coding was difficult and time-consuming but was chosen because of the authors desire to engage with, and better understand, the data (Creswell, 2014). The codebook included sensitising concepts, which were categories that the author brought to the data and had their origins in the previous literature, and indigenous concepts, which were key phrases, terms, and practices understood from the perspective of the participants. This combination was used to avoid ambiguity and confusion in the data (Figure 10). This also applied to the typology of the data, where the codebook used a combination of analyst-constructed and indigenous typologies. Analyst-constructed typologies refer to typologies that were constructed by the author to explain findings, while indigenous typologies refer to the language and important distinctions that were used by the participants (Patton, 2002). It was understood that it was important to use this combination because some codes from the previous literature are expected by the audience, and some codes are important to include from participants because they emerged from data that was not anticipated (Creswell, 2014). The author looked for reoccurring regularities that could have been sorted into categories, and explored what fitted together (Figure 11). This is called convergence and provided meanings extracted from the data, a framework, and allowed significance to be determined. In order to do this it was decided to have a first pass of coding that created codes from the general interview guide topics and the previous literature, and was applied to both studies 1 and 2. For example, when the participant discussed leitmotif anywhere in the interviews the code leitmotif was assigned to that discussion in the codebook. After this, the author used divergence to flesh out the categories. This was done by extension (building on already known information), bridging (making connections between different items), and surfacing (new information that fits, and is verified).

A second pass of coding that created codes from the emergent perspectives of participants and additional information from the previous literature were applied to studies 1, and 2. For example, when participants discussed their appreciation of VGM repetition, an emergent form of data, anywhere in the interviews the code appreciate was assigned to that discussion in the codebook. Categories were judged by internal and external homogeneity. Internal homogeneity is the extent to which the data in a category hold together, while external homogeneity is the extent to which

differences among categories are clear. It was the author's responsibility to verify meaningfulness and the accuracy of the categories. Categories were tested for completeness by having internal and external plausibility. Internal plausibility means that categories should appear consistent, and external plausibility means that they should comprise the whole. The categories were inclusive of the data, and were tested against the reference of the phenomenon being investigated (Patton, 2002). The codebook was organised using the categories from the organisation phase of the analysis: *the player experience*; *familiarity and music*; *leitmotif and repetition*; *approaches and techniques with regards to VGM repetition*; *future of VGM repetition*; and an additional category of *closing comments*.

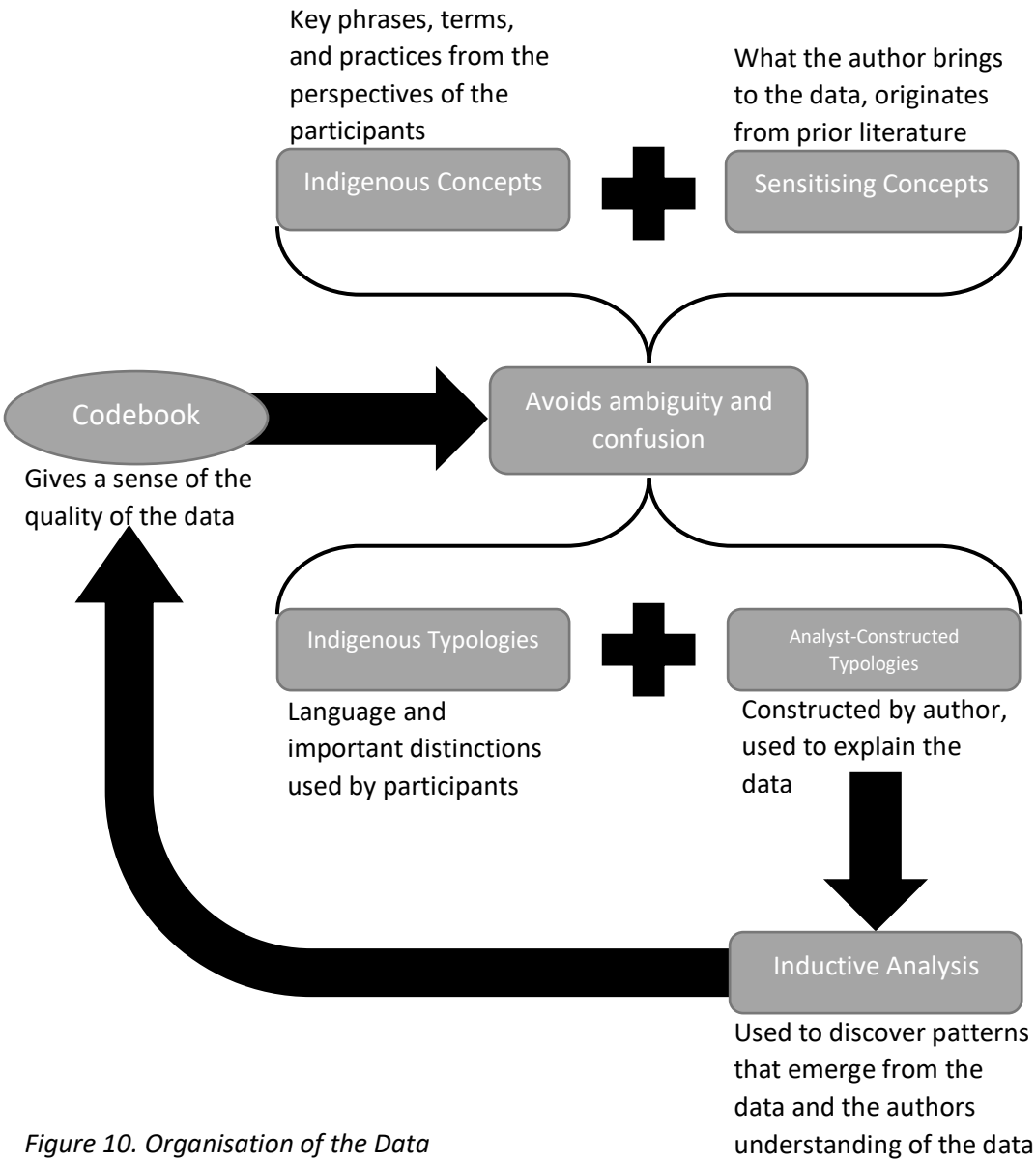

Figure 10. Organisation of the Data

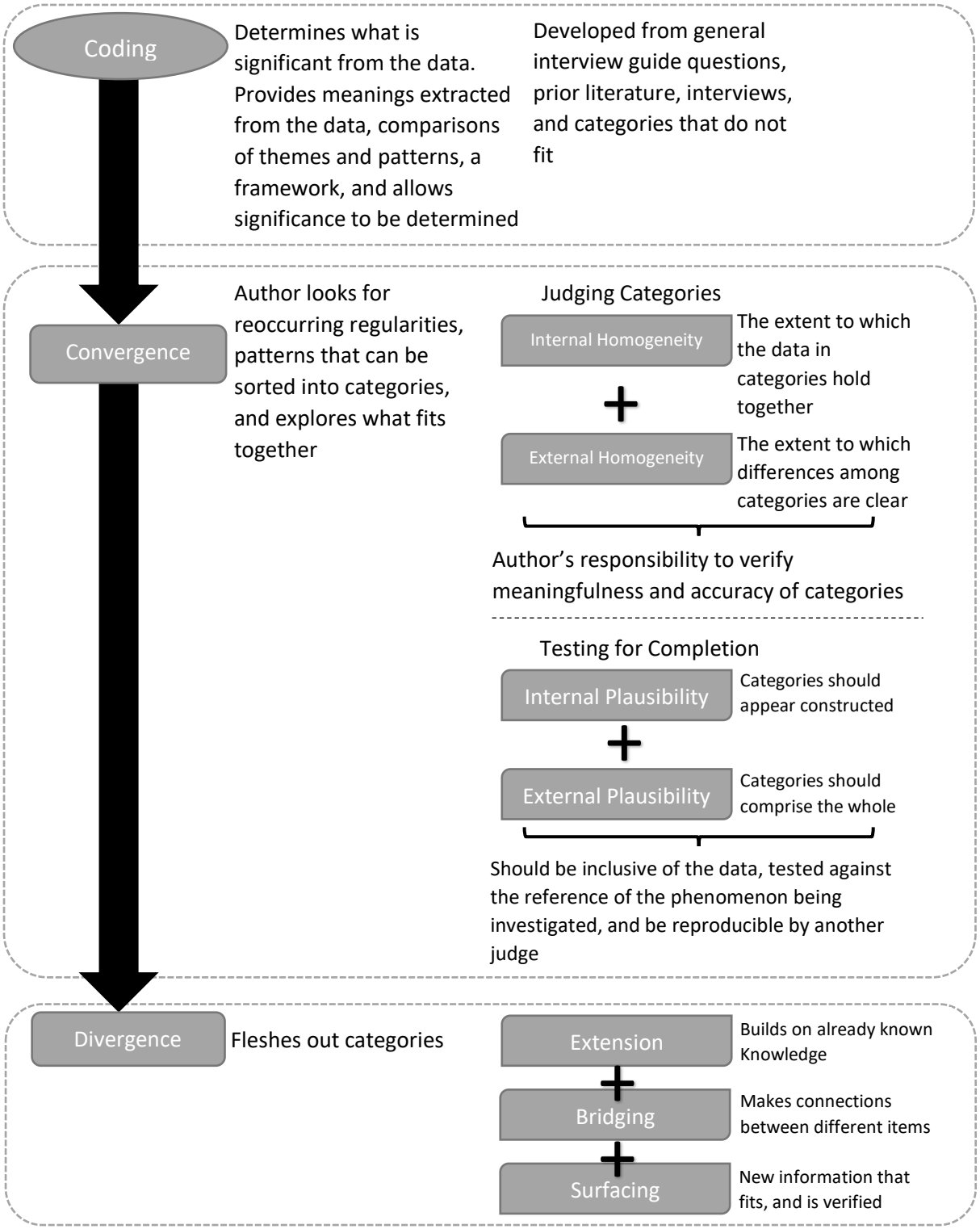

Figure 11. Coding

Thick Description

Thick description provided a rich foundation for the analysis and reporting, placing the reader into the phenomenon being studied (Figure 12). The process grouped together answers from different participants to common questions and analysed different perspectives on central issues. Answers

form different participants were grouped together from the codes in the codebook, which produced patterns. For example, when the code leitmotif was observed in the codebook in the category of *leitmotif and repetition*, the relevant discussion was placed in the section of the codebook under leitmotif during the thick description phase. Even if the code leitmotif appeared when discussing the category of *the player experience* the relevant discussion was placed under leitmotif. This produced a section of the codebook which contained all of the participants' discussions that included the code leitmotif. Major patterns in the data were identified using inductive analysis because it was understood that it is used to discover patterns from the data. Inductive analysis relies on findings that emerge from the data and the researcher's understanding of the data. It is the researcher's responsibility to identify, define, and explain the patterns that emerged from the participants' perspectives, and if necessary it is the researcher's responsibility to develop patterns that do not have terms or labels (Patton, 2002).

The patterns were very similar to the topics from the general interview guide but were fleshed out, and reworked, by codes that emerged from the codebook because it was understood that codes are used to generate themes, and patterns. This constituted a descriptive analytical framework (Creswell, 2014; Patton, 2002). The patterns that emerged were organised using the categories from the earlier phases of the analysis process. However, the category of *closing comments* was removed because the topics discussed by the participant in their closing comments were merged into the relevant categories that discussed those topics. For example, if a participant discussed procedural audio in their closing comments it was moved to the pattern sub-category of procedural audio inside the category of *approaches and techniques with regards to VGM repetition*.

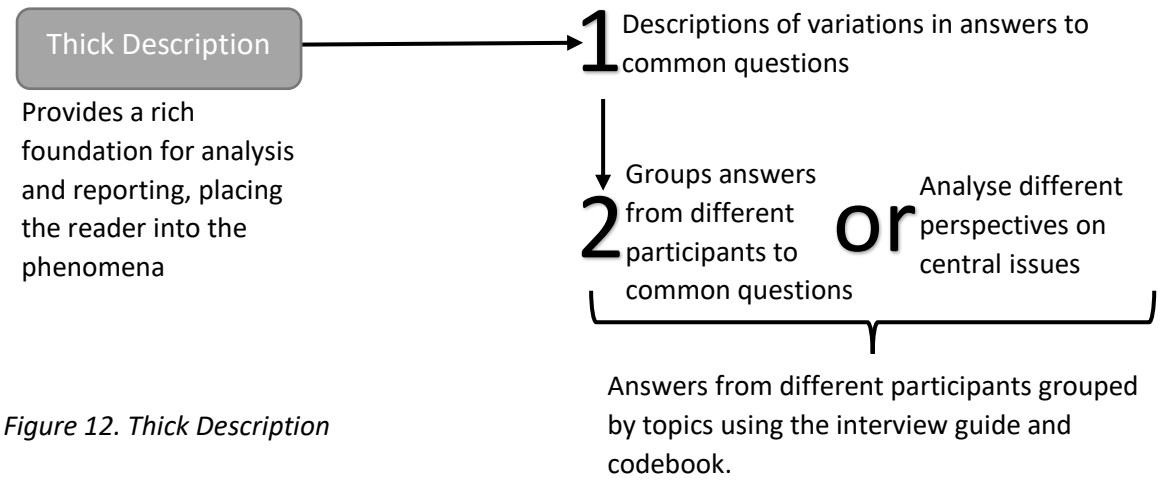

Figure 12. Thick Description

Data Reduction

Themes were created using content analysis and were created from the patterns identified from the thick description phase of the analysis, and from codes in the code book. Discussion of specific patterns were assigned themes. For example, a discussion that included the patterns of video game enjoyment, player engagement, and VGM as a negative phenomenon were assigned three themes named ENJOYMENT/ENGAGEMENT/NEGATIVE PHENOMENON. This allowed the researcher questions to be removed from the codebook in order to reduce the data, however, some researcher questions and replies were retained because they were part of a relevant discussion. It was understood that themes interconnect to create a narrative, and are shaped into a description (Creswell, 2014). To do this the data was analysed one last time using themes. All the data which included a theme was placed into one section of the codebook under the title of that theme. For example, all the participants' data that discussed the theme of SCENE was organised into one section of the codebook which included all the themes titled SCENE. This produced a dedicated section of the codebook which had all the relevant data corresponding to the theme of SCENE. This produced some cross-classification in the themes, which generated new insights into the emergent patterns (Patton, 2002). Also, additional discussion that mentioned the theme in a code was also placed in the relevant section of the codebook. For example, if the participant discussed the scene but did not have SCENE as the theme of the discussion, the discussion was placed in the SCENE section of the codebook under the sub-heading Did Not Fit. Thus the data was split between what fitted the theme (convergence) and what did not (divergence). This created a version of the codebook which included codes, themes, and categories:

The player experience

- ENGAGEMENT
    - Video game ENJOYMENT as a measure of engagement
        - VGM repetition's impact on video game enjoyment
            - Repetition as a NEGATIVE PHENOMENON
                - IRRITATE, ANNOY, DISTRACT, DISCONNECT, CONTRADICT, DISTURB, BORE, DISGUST, NON-PLEASURABLE, INTRUSIVE, FRUSTRATE, DISENGAGE, BREAKS FLOW of the video game, INDIFFERENT, TEDIOUS
            - Repetition as a POSITIVE PHENOMENON
                - APPRECIATE
                - TOLERATE

Experience, Engagement, Enjoyment, Looping and repetition, Negative phenomenon, Irritate, Annoy, Distract, Disconnect, Contradictory, Disturb, Bore, Disgust, Non-pleasurable, Intrusive, Frustrate, Breaks flow, Indifferent, Tedious, Positive phenomenon, Motivation.

Academic, Immersion, Player mood, Game mood, Affect, Anxiety, Stress, Arousal, Tolerate, Appreciate.

Familiarity and music

- FAMILIARITY with VGM
    - LIKING increases with familiarity
    - Subjective COMPLEXITY with VGM decreases with familiarity
    - OVERUSE (Overfamiliarity)
        - SATE and LISTENER FATIGUE

Familiarity, Liking, Complexity, Preference.

Overfamiliarity, Sate, Listener fatigue, Overuse.

Leitmotif and repetition

- LEITMOTIF
    - COMMUNICATION of meaning
        - Acts as FEEDBACK to the player
        - AIDS & GUIDES the player
        - AIMS & GOALS of the video game
        - FOCUSES player
        - Helps with the LEARNING CURVE of the video game
        - IDENTIFIES SETTINGS, CHARACTERS, NARRATIVE, and MOOD
    - APPROPRIATE VGM
        - SCENE (game events and player activity)
            - PLAYER DELAY
        - VGM/GAME GENRE
    - VGM THEME
        - CONTINUITY throughout the video game
        - UNITY across a franchise
        - Can make the video game ICONIC
        - Adds IDENTITY to the video game

Leitmotif, Feedback, Communication, Aids and guides, Aims and goals, Focuses player, Learning curve, Identifies settings, Identifies, characters, Identifies narrative, Appropriate, Scene, Music/Game genre, Theme, Unity, Continuity, Iconic, Identity.

Player delay, Easter egg, Identification with hero, Aesthetic, Overworld, Iconography, Metaphor, Lore.

Approaches and Techniques with regards to VGM repetition

- APPROACHES & TECHNIQUES used to reduce, conceal, and remove VGM repetition
    - ADAPTIVE/DYNAMIC music (interactive music)
    - VGM should be heard only in the BACKGROUND
        - CATCHINESS of VGM
        - NON-MEMORABLE melodies
    - VGM interspersed with SILENCE
        - VGM as a form of FORESHADOW
    - Compositional techniques in VARIATION
    - PLAYLISTS as an alternative
        - USER-SELECTED
            - STRATEGIC USE
        - LICENSED music
        - MUSIC PREFERENCE TOOLS
    - PROCEDURAL AUDIO
- INTERACTIVITY of video games
    - VGM LISTENED TO IN DIFFERENT WAY
    - CONTEXTUALLY DEPENDANT
    - Player AGENCY
    - DIEGETIC/NON-DIEGETIC music
- ROLE of VGM
- FUNCTIONALITY of VGM
- IMPLEMENTATION of VGM
- MULTIPLAYER and SINGLE PLAYER differences with regards to VGM repetition
- RETRO video games and looping
    - NOSTALGIA
    - EXPECTATION for retro aesthetic

Approaches and techniques, Adaptive/Dynamic, Background, Catchiness, Non-memorable, Silence, Variation, Playlist, User-selected, Licensed, Music preference tools, Procedural audio, Interactivity, VGM listened to in different way, Agency, Functionality, Implementation, , Multiplayer, Single player, Retro.

Reactive, Flexibility, Real-time, Attributes, Foreshadow, Personalisation/Customisation, Strategic use, Player performance, Non-linear, Co-author, Film music, Contextually dependant, Diegetic/Non-diegetic, Role, Suspension of disbelief, AAA, Gameplay, History, Culture, Nostalgia, Expectation, Technological constraints, chiptune, OST, Score, Composition, Structure, Tempo, Improper cueing, Quality.

Future of VGM repetition

- FUTURE of VGM repetition

Future.

LEGEND:

Categories; THEMES; 1st Pass Codes; 2nd Pass Codes.

(Codes have been placed in categories they were generated from)

Interpretation

Discussion Overview

Once the data collection and analysis phases were complete, the data interpretation phase started. Interpretation began with explaining meanings from the interviews by using the codebook developed from studies 1 and 2 (Figure 13). The author worked back and forth between the data, and their own perspectives, to explain and make sense of the evidence. Comparing cases and categories also made sense of the data, including alternative interpretations. This was done by inquiring into and interpreting causes, consequences, and relationships. It was understood by the author that interpretation should go beyond the descriptive data, and that a distinction between explanation, and understanding, must be made. This meant attaching significance to the findings, making sense of the findings, explaining the findings, drawing conclusions of the findings, considering meanings in the findings, and attempting to understand patterns that emerged from the findings. At this stage the ambiguous term of enjoyment was also fleshed out with the different dimensions, explanations, and concepts discussed in the previous literature in order not to oversimplify enjoyment. Rival explanations, disconfirming cases, and data irregularities were part of the rigors of interpretation. Interpretation took the form of confirming what was known and supported by the data, interpretation illuminated what is not known but should be known, and interpretation exposed misconceptions (Burns, 2000; Clough & Nutbrown, 2007; Creswell, 2014; Flick, 2014).

It was understood by the author that questions about reflexivity and voice will be asked with regards to the process of engaging with the data in order to extract findings. Self-awareness and self-analysis was understood to be a requirement of qualitative inquiry. Self-reflexivity challenged the author's own epistemologies, questions about the reflexivity of the participants and the audience were also asked. The final step of data reduction was how the author reported the findings. This involved knowing the audience for the study and strategic communication (what the author would have liked to say to them). There was a balance between description and interpretation, where decisions about what was omitted during data reduction involved how much description was included, what was significant in the descriptions, and which descriptions provided enough detail to illuminate the phenomenon. Descriptions provided a framework for context and meaning, which led to interpretation (Burns, 2000; Clough & Nutbrown, 2007; Creswell, 2014; Flick, 2014).

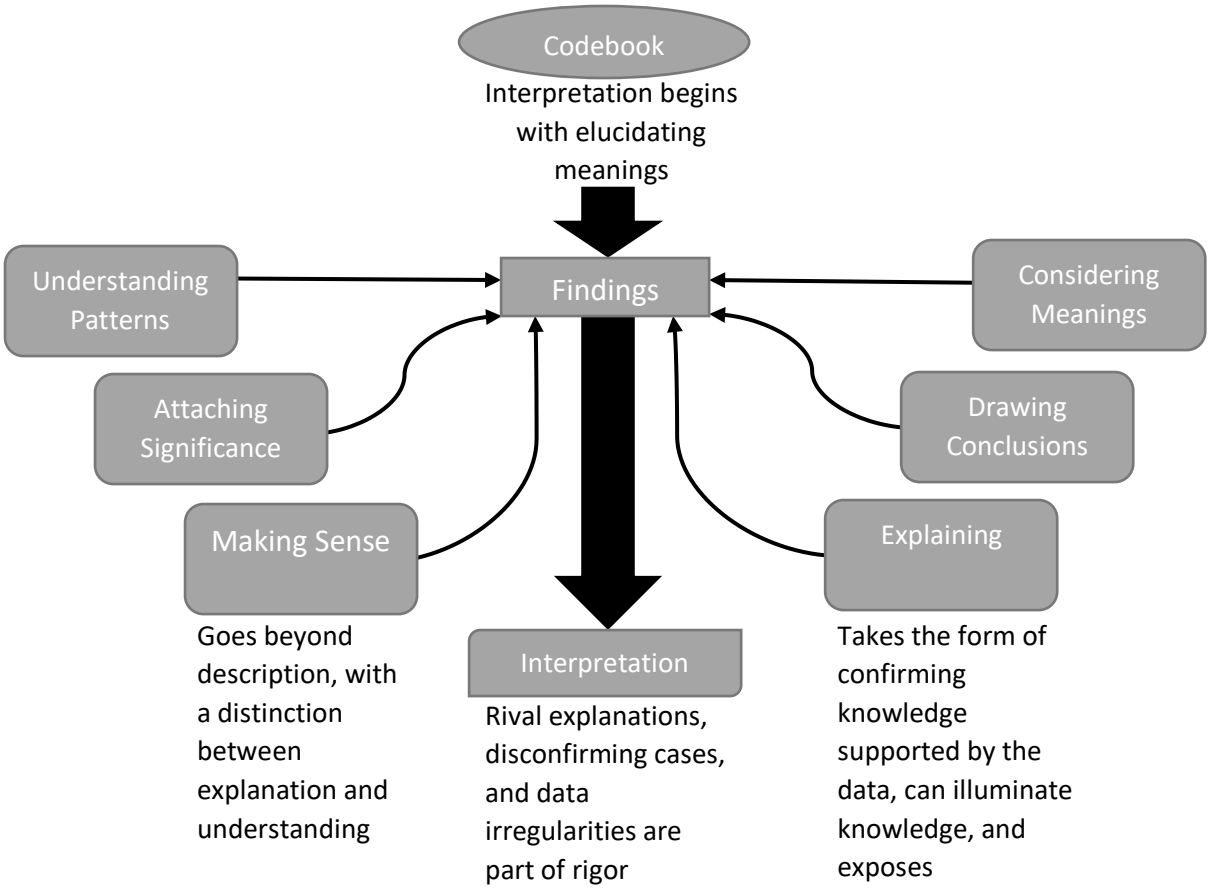

Figure 13. Interpretation

Heuristic Inquiry

The strategy of heuristic inquiry was used to interpret the data (Figure 14) in this study because of the author's own experience with repetition of VGM. It was used in the interpretation of both studies 1 and 2. It was understood that there are five phases of heuristic inquiry (Patton, 2002):

- Immersion, involved the author placing themselves within the experience fully;
- Incubation, involved the author deliberately withdrawing themselves and allowed insights, meaning, and understanding to emerge;
- Illumination, involved the author expanding awareness and deepen meaning to add clarity to the experience. Textural and structural descriptions were revealed through emergent themes and patterns, which formed clusters, and allowed understanding to grow;
- Explication, involved the author focusing and reflecting on the experience. The experience unfolded, and any other dimensions of meanings were added, this allowed the author to connect themes through further exploration. A depiction of the experience and a portrayal of the participants also emerged;

- Creative synthesis, involved the author bringing together all the pieces that made the whole experience. It showed patterns and relationships that emerged, and showed new perspectives and meanings of the experience.

Ultimately, the author believed the purpose of heuristic inquiry was to explain the meanings of the experiences of phenomena for individuals or groups, and it is was understood by the author that the richness of the experience, and the perspectives of the participants, was to be shared and communicated in a creative, and personal way using this strategy (Patton, 2002).

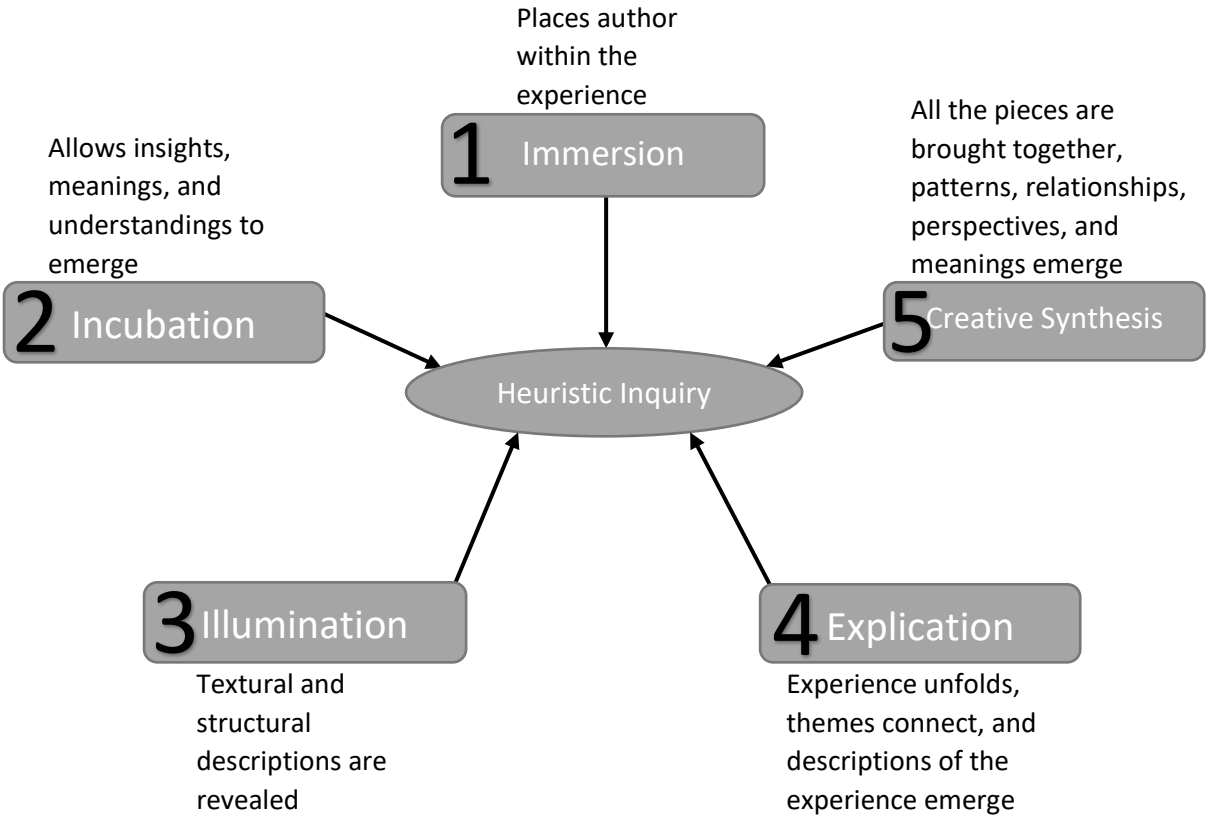

Figure 14. Heuristic Inquiry

FINDINGS (The participants' quotations version can be found in **APPENDIX A**, **Findings Complete**)

Enjoyment, Repetition, and Interactivity

Adam H explains that his irritation with the repetition of VGM is not a major issue but it still has a negative impact on his enjoyment of a video game. However, even though he would not stop engaging with a video game he does think that repetition can distract, disconnect, disengage, break flow, and be non-pleasurable for him. He admits that the VGM in a video game is not the most important aspect of the audio when he is engaged with video games. He explains that the VGM motivates him in more action-orientated FPS games but in roleplaying (RPG) video games, which require strategy and tactics, the VGM has a more secondary role for him:

> "the music that's in Doom that is generally perfect, it's just that it builds up and when you've got adrenalin pumping you've got rock music in the background egging you on. But it's, I'm playing, again a game, say, Witcher or, I dunno, anything like that I guess the, I'd much prefer to be thinking everything in my head rather than going guns blazing"

He believes that the repetition of VGM depends on the genre of game he is playing. He perceives that simple and abstract retro games, which employ looped VGM, are different compared to complex and modern 3D video games. He thinks that looping of VGM in a retro game is more appropriate and adds to his enjoyment of those video games:

> "Tetris and that little jingle it has, it's very much one of the core elements, or one of the recognisable things of Tetris"

However, his views on VGM repetition in modern 3D video games is that it can irritate him. He discusses that due to the complexity of these video games more complex VGM is required:

> "if I'm playing a more complex RPG, playing Witcher 3, you have something that is obviously repetitive, then I guess you're gonna, you'd feel irritated"

His view on repetition in the context of independent video games (indie games), which are usually made by smaller development teams and are simpler compared to large-scale developed video games made by major developers (AAA video games), is similar to that of retro games where he is more tolerant of the VGM repetition compared to AAA video games.

Alice has a simple, yet straightforward view on the repetition of VGM and her video game enjoyment. She thinks that her enjoyment of a video game is dependent on the way that repetition of VGM is implemented. She views repetition of VGM to be generally a negative phenomenon which impacts her enjoyment of a video game and agrees with all the negative themes.

Daniel understands that VGM is heard differently in video games due to their interactivity. Daniel thinks that it is difficult to create VGM for video games due to project constrains such as financial and time constraints, and is more tolerant of the repetition of VGM because of this. He admits that he would like non-repetitive VGM if it is implemented into a video game. He believes that the way it is implemented also makes a difference, where silence is interspersed between the VGM instead of the VGM constantly looping:

> "World of Warcraft. When you go into main Alliance city: Stormwind…it's not like the track finishes and it's just played all over again all the time, there is, sometimes no music at all, it's just ambient sound, and then it gets played again"

Max discusses that his enjoyment of video games with regards to VGM repetition is dependent on whether he is enjoying the game or not:

> "the Dark Souls series where the game itself is very frustrating, being a difficult game, and the music tends to, if it's repetitive, it starts to get annoying after a while cos you're doing the same thing over, and over again"

Midge understands that VGM is listened to in different ways in video games compared to more linear listening contexts. He feels that he is not specifically listening to the VGM because there are other things that he is concentrating on in the video game, and he sometimes uses his own user-selected playlists because of this:

> "as you're playing Total Annihilation there is a classical score going on, and it's very nice and everything, as you go to combat everything changes and it's all, it's all nice, but you don't play the game for its music"

Midge is appreciative of VGM repetition when it is implemented in a very specific way. He views repetition of VGM as a positive phenomenon when it is implemented with the specific role and function of increasing tension in a scene. He believes that this use focuses him and it increases his enjoyment of a video game. In another example he discusses a scene appropriate leitmotif which identifies settings where he is more focused on the dialogue of the non-playable characters (NPCs) and is not concentrating on the VGM:

> "with Dues Ex, you've got that nightclub going on but you're busy listening to the conversations between the NPCs that you're talking to, the ones that you walk past, everything that you're looking for as you're walking around, you're not really, it's not really a concern"

However, with video games that require more attentional resources of the player and utilise VGM as feedback, he does not notice the changes in the scene appropriate leitmotif as much, but still appreciates its implementation.

Tom W listens to VGM differently compared to more linear listening contexts because he will continue to listen to repeating disliked VGM when he is engaging with a video game, even if he will not enjoy that particular scene as much.

Vlad discusses diegetic music in a video game. He gives an example of a FPS game franchise which uses diegetic music in the form of jukeboxes that are hidden in the video game (the actual example given does not utilise jukeboxes, but other games in that franchise do). He explains that he listens to VGM differently because of the implementation of these jukeboxes and he has player agency to select the music to be played. He also appreciates their implementation because the repeating music provides him with feedback:

> "Bioshock Infinite when you get to the, you've got the jukebox things, right? You can actually select the music tracks that play, you know? Yeah, you associate with that area, that's actually helpful cos you're like: 'OK, I'm back where I should be, yay, I can do stuff here'"

Familiarity, Liking, Complexity, and Overfamiliarity

Adam H confirms the relationship between repeated exposure, familiarity, and liking but also discusses how familiarity has a different effect on his video game enjoyment. He relates more to songs when it comes to familiarity increasing his liking of the VGM. He explains that for a video game that he enjoyed, he initially disliked the VGM but after repeated exposure to the VGM his familiarity increased. As he became more familiar with the VGM he started to like the VGM more until his familiarity with the VGM changed his view of the VGM from initially disliking it to liking it:

> "Jet Set Radio, I absolutely loved that game, the music that's in that is, well its's a song rather than a backing track or anything like that…first time I heard them absolutely hated them, couple hours into playing the game you're humming along and then the next thing you know all the words to it"

Interestingly, he also discusses familiarity in a different context where repeated exposure leads to familiarity and that familiarity means he notices the VGM more when it is appropriate to the scene. He explains that with familiarity he starts to notice parts of high complexity VGM that he initially did not, which also increases his liking for that high complexity VGM:

> "Crypt of the NecroDancer is a massive one on this cos everything's based of moving to the music…you get used to the beat, and you're tapping a keyboard, you're humming to yourself, getting into it"

Alice thinks that her familiarity increases her liking of the VGM, but that does not mean she ultimately likes the familiar VGM. Her liking increases from initially disliking the VGM to tolerating the VGM and being indifferent to it. She feels that when she likes the VGM she can tolerate the repetition of VGM, however, when she does not like the VGM then she gets annoyed by the repetition. When she discusses licensed music playlists her preference for the liked VGM means she tolerates the repetition but her experience is different with disliked VGM which repeats, and she has a negative opinion of that VGM. She also gives an example of VGM which she believes to be overused due to looping where she becomes stated and suffers listener fatigue, even if she originally liked the VGM:

> "any Final Fantasy game, they're really bad with that. Their background music is so repetitive, and not in a good way, and it may be really pretty but once you've had it looping for an hour it's not nice anymore"

She is more tolerant of VGM repetition when the VGM is high complexity. She feels that repetition due to looping becomes more noticeable when the VGM is low complexity.

Daniel believes that repeated exposure to liked VGM leads to overfamiliarity which in turn leads to listener fatigue and satiation for him. He is tolerant of VGM repetition when the VGM is disliked and has two solutions to disliked VGM which repeats. The first is that he is indifferent to disliked VGM which repeats, and explains that as he becomes more familiar with the disliked VGM he becomes more tolerant of it even though he still dislikes the VGM. The second is that he turns off the VGM and replaces it with an alternative of his own user-selected playlists.

He has the view that his video game enjoyment is dependent on the complexity of the repeated VGM. He discusses different genres of VGM with regards to the complexity of the VGM where he notices different aspects of the VGM due to repeated exposure and familiarity with the VGM. He recognises the VGM due to familiarity but also additional parts of the structure and instrumentation of the VGM due to repeated exposure with a high complexity VGM:

> "World of Warcraft, remember when you go inside of Stormwind, the main city?, you can hear a similar tone through the whole fifteen or twenty minutes track…after a few minutes, however, it has that chorus added on top of it, and it creates something different"

He is tolerant of low complexity VGM repeating if he believes it is appropriate the scene and video game genre. He believes that the overfamiliarity of low complexity VGM that repeats due to looping

often, and over long periods of time, has an impact on his video game enjoyment due to listener fatigue and satiation. However, he has the opinion that more complex VGM which repeats less due to it not constantly looping, and different VGM being used to replace it, is less noticeable with regards to repetition. He explains that even if he becomes overfamiliar with higher complexity VGM the repetition of the VGM would not have an impact on his video game enjoyment.

Jimmy believes that repeated exposure increases his familiarity with the VGM and that the familiarity with the VGM communicates meaning for him. He has the experience of his subjective perceived complexity decreasing with familiarity with the VGM. He explains that when he initially is exposed to a piece of VGM he does not register the lyrics of the song. However, after he becomes familiar with it he begins to understand the lyrics more and his subjective perceived complexity decreases with the piece of VGM, and his liking with the piece of VGM also increases:

> "Final Fantasy. Towards the end of every game there will always be a sort of music, a song that plays with it, and initially you probably don't understand the lyrics, or probably can't hear exactly what the singer is saying, but after you listen to it a few times you then hear, you then get to know the lyrics, what they're trying to say"

His video game enjoyment decreases when disliked VGM repeats and explains that player delay in a scene that he is not enjoying is intensified by the repetition. He explains that his enjoyment of a video game scene depends on whether he likes the repeated VGM, and he would like to turn the repeating disliked VGM off in those situations. However, when he likes the VGM he has a different opinion. Jimmy sometimes appreciates liked VGM leaving it on a loop and moving away from the keyboard (AFK), essentially allowing the liked VGM to repeat and enjoying the VGM without actually progressing any further with the video game. He admits that this is not necessarily engaging with the video game in a conventional manor, but it shows that when he likes a piece of VGM he will make an effort to appreciate it.

He believes that overfamiliarity has an impact on his video game enjoyment. He gets sated with the VGM when it is overused and is made worse due to his player delay. Jimmy feels that overfamiliarity with the VGM increases his awareness of the repetition and causes listener fatigue for him. He admits that this repeated exposure has an impact on his engagement and finds the repetition intrusive, distracting, non-pleasurable, contradictory to the scene, it disconnects him from the video game, and it breaks his flow. Rather than the VGM helping him to focus on the video game it does the opposite and disengages him from it:

> "Final Fantasy IX. Towards the end of the game it gets really heavy…especially when the fight drags out to half an hour, to one hour, then you realise that this music's really getting into your head now, it's starting to really mess your engagement up"

Max has the experience of repeated exposure to VGM increasing his familiarity with that VGM, which increases his liking of that VGM. He explains that repeated exposure to variations of a leitmotif increases his familiarity with the leitmotif. Initially being indifferent to the leitmotif, which is low complexity, repeated exposure to the leitmotif, which increases in complexity with every repetition and variation, increases his familiarity of the leitmotif:

> "OK, I'm gonna keep going back to Breath of the Wild here because it's a recent game I've played…a side quest mission where you start form a little village, and as you recruit certain people it starts to add extra tracks to the song"

This familiarity increases his liking of the leitmotif, which in turn increases his enjoyment of the video game.

He believes that overfamiliarity has an impact on his video game enjoyment even when he likes the VGM initially. When he is having trouble progressing through a video game, having to play sections of video games repeatedly where he is exposed to the same piece of VGM repeatedly, he finds that he suffers listener fatigue and satiation:

> "I'm playing another game called Fire Emblem at the moment, and each level's got a set soundtrack to it, and you hit the harder levels where you have to repeatedly play the level in order to pass it, sort of thing…I enjoyed the music when I first played it, but when you're at you're thirtieth attempt at that level, hearing that same song again, I'm just like: 'Oh, I know what's coming now'"

However, he does admit that his frustration is more to do with his progression with the challenging video game rather than the VGM repetition. He explains that sometimes the VGM repetition will distract him, can be intrusive, can become tedious, and will break his flow. In these situations he turns off the VGM so that he can focus a particular aim or goal and progress past that scene.

Midge gives examples of how familiarity with VGM increases his liking of the VGM when he is engaging with a video game and when he replays a video game:

> "Borderlands: The Pre-Sequel had a song in it that, it's on the expansion, like Claptraps Robot Revolution, you hear it and then you hear it later on as you're fighting a boss, and it all makes

sense and everything, yeah, that gets more enjoyable as I heard it more cos it gave some context to it"

He continues to discuss his familiarity with a piece of liked VGM, where he purposely plays the video game so he can enjoy the piece of VGM:

"Flashback music for that game…you found a little holocube on the first mission, and that had a really good bit of music to it, and I really enjoyed that, and I've subsequently gone back, and played the game multiple times, just for that bit alone"

He perceives that the repetition of VGM and his enjoyment of video games is dependent on the complexity of the VGM. He believes that lower complexity VGM which becomes overfamiliar is annoying due to satiation and listener fatigue, even if the VGM is catchy and memorable. However, from time to time he does notice nuances in the complexity of the VGM, but it is not often when he is engaging with video games. Midge believes that the role and function of VGM within appropriate scenes is more important than liking the VGM, and this has a positive impact on his video game enjoyment. He explains that even disliked VGM which repeats and is appropriate to the scene has a positive impact on his enjoyment of a video game:

"I'm not a massive fan of, say, dance music but when you're playing Deus Ex, I think it is, and you go into the nightclub…I enjoy those tunes because of the situation they are in rather than what they actually are"

However, when disliked VGM which repeats is not appropriate to the scene it can annoy him and interfere with his enjoyment of a video game.

Tom A discusses that familiarity increases his liking of VGM, helps him to engage with a video game, and it improves his enjoyment of a video game. He has the experience of repeated exposure to VGM increasing his familiarity with the VGM and that his increased familiarity increases his liking of the VGM. He also discusses that this increased familiarity helps him to engage with a video game where the familiar VGM makes engagement easier for him. He explains that VGM is not listened to initially when he is engaging with a video game, however, as he becomes more familiar with the video game he begins to listen to the VGM. As he becomes more familiar with the VGM, which is appropriate to certain scenes, he is more aware of the change in VGM when scenes change, which provides him with feedback. This change is recognised because he is familiar with the VGM due to repeated exposure to scene appropriate VGM when he replays certain scenes.

He has the view that as long as he likes the VGM and is not overfamiliar with it then the VGM increases his enjoyment of a FPS game. He explains that his liking of the VGM makes a difference with regards

to his views on VGM repetition, even with repeated exposure, if he likes the VGM he does not view VGM repetition having a negative impact to his video game enjoyment. His experience is different when he does not initially like the VGM and admits that when disliked VGM is repeated he feels annoyed. He says that he disengages with video games when disliked VGM repeats, going as far to say that he finds it difficult to engage with video games if the VGM is disliked. He is more tolerant of the repetition of disliked VGM with video games that he enjoys engaging with. However, he can become overfamiliar with the repeated VGM if he has to replay the scene too often due to player death. In this context he can feel sated and his video game enjoyment can decrease.

Tom P feels that disliked VGM which is repeated increases his liking, but not to the point that it changes his opinion of the disliked VGM into liked VGM. He explains that familiarity with disliked VGM, where the repetition annoys and irritates him, means he is more tolerant of the VGM and indifferent to the VGM which repeats. In situations where he likes, and is more appreciative of, the VGM he will actively seek out scenes where the VGM is used appropriately because of preference for the VGM:

> "The Legend of Zelda series, the initial one, there was desert scene, where the music in the desert scene I really liked, so once I unlocked that I'd probably go back to that and do stuff in that area just because I preferred it to certain other areas"

He perceives familiarity with VGM appropriate to certain scenes as a positive role and function of VGM, where the familiarity with the repeated VGM helps him with the learning curve of the game, warning the player of danger and providing them with feedback. However, he is not tolerant of simplistic VGM that could be considered abstract which irritates him. Tom P can become overfamiliar with repeating VGM which causes listener fatigue, and has an impact on his immersion and engagement. He also believes that repeated exposure to the same VGM disconnects him from the video game.

Tom W explains that repeated exposure to VGM and familiarity decreases the subjective perceived complexity of the VGM for him. He initially does not notice all of the complexity in the VGM but when he becomes more familiar with the VGM he starts to notice different aspects of the VGM, which increases his liking for that VGM. He has the opinion that VGM complexity and implementation make a difference with regards to VGM repetition as a negative phenomenon. He explains that VGM, which is high complexity, is looped due to player delay in a scene becomes non-pleasurable, contradictory to the scene, and boring for him. He discusses that overuse of that leitmotif when it is not used in the original context has an impact on his video game enjoyment. He feels that when a specific leitmotif is overused and implemented in a way that he believes to be lazy or inappropriate, then the original

meaning of that leitmotif is lost. He believes that there is a disconnect from the scene and he feels indifferent to the leitmotif:

> "Mass Effect. Yeah, and they have the main menu theme from the first game, they use that a lot in the third game to convey really big moments but they, I think they went a little bit overboard. So it, to a detriment, it brings one of the greatest tracks in the whole series down a little bit"

Vlad understands the relationship between repeated exposure, familiarity, and liking but does not have any experience of that happening to him within the context of video games. He has never experienced repeated exposure of VGM increasing his familiarity and liking of the VGM when he is engaged with a video game. He has the opinion that repetition of disliked VGM is tolerable if the video game itself is enjoyable, but feels that overfamiliarity can affect his enjoyment of a video game. He explains that disliked leitmotif, which repeats, has a negative impact on his video game enjoyment, but because he enjoys a certain aspect of the video game he turns off the disliked VGM so that he can continue to enjoy the video game:

> "for instance Warcraft III, alright? I ******* despise the Undead theme for some reason, I don't know why, I just thought it was pretty bad. So, but I still played Undead in that game cos they were ******* broken at the time, everyone was playing that, you know? So, although I usually muted it every time I would play that race"

He believes that complexity also has an impact on the player's video game enjoyment with regards to repetition of VGM. He discusses that player delay and VGM complexity can have an impact on how much repetition the player hears. He believes that high complexity VGM can take longer to loop, which means that player does not always hear when the VGM is looped due to the length of the VGM. He believes that repeated exposure of low complexity VGM increases his familiarity with the VGM, which he enjoys for a short duration. However, low complexity VGM, which is looped, can become overfamiliar, and he can suffer listener fatigue, which decreases his enjoyment of a video game.

He believes that VGM is a negative phenomenon if it just loops without it being functional. He has the perception that the repetition of VGM in single player games, which is not functional, disconnects him from video games, is intrusive, and he becomes indifferent to the VGM. He explains that when he likes the VGM he enjoys becoming familiar with it, but if he gets overfamiliar with the repeated VGM he begins to dislike the VGM which he originally liked. This is especially the case for video games that require more time and effort to progress in, such as RPGs, as he gets bored with the repeated VGM.

He feels that if he is getting bored with the gameplay of a video game and the music is looping repeatedly then this leads to overfamiliarity:

> "say you're playing a Fallout game, right? And you know how every area has its own soundtrack and stuff, yeah? Well if all of them had the same soundtrack, and you'd hear that over and over, it gets pretty dull pretty quickly"

He has a different view for retro games where he appreciates that the technological constraints of the hardware used means that he can tolerate the overfamiliarity and the VGM repetition.

Leitmotif and Theme

Adam H enjoys the implementation of a repeated leitmotif, which becomes familiar to him, when it communicates meaning to him in a video game. He appreciates its use when he completes an aim and goal of a game where it provides him with feedback, and when a repeating leitmotif is implemented which identifies characters in a video game which aids, and guides, him:

> "when you see Sephiroth in Final Fantasy VII it has the same backing track, so. It gives the person an identity or a feel, though you know when you see Sephiroth in Final Fantasy VII this guy's evil, he's got orchestra and choir singing for him, this biblical yet evil way"

He also appreciates a repeating leitmotif when it identifies settings and mood in a video game. He finally concludes that unless the repetition of VGM is functional then it can irritate him:

> "I've been playing Ocarina of Time again for the 3DS, and in parts of that there is massively obvious repetition of the music. So you've got walking through the Lost Woods and there's this song playing on the Ocarina in the background, I don't know, I think that doesn't irritate me because you're using this repetition to understand if you're going the correct way through the world and stuff like that. But if it's not meant to be used for a certain thing I guess it's, yeah, irritating"

He explains that an iconic theme, that incorporates a familiar leitmotif which identifies characters and mood, or a variation of that theme, motivates him and helps him to identify with the hero of the video game. He says that when the theme is appropriate to the scene and is used as a form of continuity as he progresses through the game he believes that the repeated VGM empowers him, and helps him to focus on the video game:

> "going off the Halo example, when you hear the theme…it's usually in a part where it's something massively significant or you're doing something really awesome in the game, and I

> think that when you are actually doing that you, as a player, just feel insanely empowered because it feels like the theme is being played for you"

He also discusses how iconic themes can add a sense of unity across a franchise where a familiar iconic theme, or a variation of the theme, is used across different iterations of a video game franchise. He appreciates when iconic themes are used as a form of unity across video game franchises because he believes they add an identity to that franchise. He explains that he expects certain familiar iconic themes, or variations of those themes which are still familiar, to be present in the different iterations of a video game franchise. He thinks that this form of repetition creates a brand for the video game and familiarity with the iconic themes is associated with the brand by players. He views this as an important and enjoyable aspect of repetition of iconic themes when used within the context of unity across a video game franchise:

> "they could just hear the song and: 'OK, that is Halo, that is Zelda', that they use it and it becomes branding for them, and it becomes something that, I guess, they instantly associate with it and if it wasn't there you would feel betrayed I guess"

Alice is more tolerant of VGM repetition when the VGM is implemented into the functional role of leitmotif which communicates meaning to the player. She does not get as annoyed with the repetition of VGM when it is implemented as leitmotif which identifies characters and settings in a video game. She believes that this is because the repetition is not as common compared to a looped piece of VGM. She appreciates the functional role that leitmotif has in the context of communicating meaning to the player, which aids and guides her. She appreciates the repetition of leitmotif, which become familiar to her, because it acts as a form of feedback for her and she uses this feedback to help her focus, and engage with a video game:

> "I don't know if you've ever played Fantasy Star?...Even if I didn't like the music itself I appreciate the way it's used. So, I know I'm in this town, I know this character is coming, I know I am doing a boss battle versus a trash battle. So, I think in a way that's, it's good because it gives me information that I don't, after time anyway, I don't have to think about it anymore"

She believes that repetition of variations of an iconic theme, which adds to the continuity of a video game through familiarity, is tolerable. However, when she is engaged in certain scenes which are intense the VGM is not listened to, but in scenes that are less intense she does notice the familiar iconic themes and can remember instances where familiarity with variations of iconic themes can have a positive effect on her video game engagement:

> "in a game like Halo where you get some really chaotic fighting I think the music kinda shuts off in my brain, I stop hearing it because there's too much else going on. But when it's quieter, yeah, you pick up on it. It's definitely noticeable"

When discussing repetition of iconic themes, which add unity across a video game franchise, she believes that VGM repetition can have a positive impact on her enjoyment of that video game franchise. She explains that familiarity with the iconic theme acts as form of recollection for her with the different iterations of a video game franchise. Ultimately, she mostly enjoys this use of repetition but she can also be indifferent to it sometimes.

Daniel discusses his perspective on the functional role of repetition of themes, which include leitmotifs that identify settings and mood, implemented as adaptive/dynamic music into video games. He appreciates the use of repeating, scene appropriate, themes, which include leitmotifs that communicate meaning, because they provide him with feedback when he revisits settings. He enjoys the repetition of leitmotif more when he likes the actual leitmotif and its variations. He is also appreciative of the use of a repeating leitmotif which helps him with the aims and goals of the video game, and enjoys it when a repeating leitmotif is used to communicate that he has completed an aim, and goal, in a video game:

> "in Final Fantasy XIV there is exactly same music for when you finish a quest or level up"

He appreciates the implementation of a repeating leitmotif which aids and guides him, and focuses him in scenes. He discusses that certain familiar leitmotifs, which are used across a franchise, also communicate meaning, which is similar across iterations of that video game franchise:

> "it's not only for one game of Final Fantasy, it's been there for, I don't know, ten games at least. So even if you play a new game from Final Fantasy you still recognise that music"

Later in the interview he discusses the use of repeating leitmotif, which becomes familiar to him, when it helps him with the learning curve of the video game. He believes that when a repeating leitmotif is used to provide feedback to the player his video game enjoyment increases. He explains that when he is familiar with a certain leitmotif that warns him of danger he uses that leitmotif as audible feedback, which helps him engage with the video game. He explains that the leitmotif gives him enough information to warn him of the danger without telling him too much about what the danger might be, and is especially important when he does not have a visual form of feedback. He also says that even if he does not like the repeating leitmotif he still appreciates its role and function as feedback:

> "for example, Ark: Survival Evolved. Let's say I'm, cos it's a survival game I just build, build, and try not to get killed. So let's say I'm in a house and doing whatever I do, and suddenly I

> hear combat music playing, I know that something is going wrong really right now and that makes the game more fun. So it's not like the track tells me exactly everything about what's happening right now but only it tells me that something is going wrong right now"

He believes that the way repetition is used to add a sense of continuity in a video game depends on the VGM's creation and implementation. He explains that when a repeated theme that incorporates a leitmotif is used in appropriate scenes he enjoys the continuity:

> "you're playing as Master Chief and throughout Halo, from time to time, you have the same piece of music. I think it's OK if it's associated with similar events"

He has the opinion that when a familiar theme, which incorporates a leitmotif, is used as a form of foreshadowing it aids and guides him, and acts as a form of communication of meaning for him. However, if the iconic theme is repeated when it is not appropriate to the scene it has a negative impact on his enjoyment of a video game. Daniel believes that iconic themes, which add identity to a video game, and are used as a form of unity across a franchise are generally a good use of repetition. He explains that the familiarity of certain iconic themes are expected, and liked, by players of that franchise, which can help the identity and branding of that video game:

> "say in Final Fantasy, if you ride a mount, Chocobo, there is a track that is always played when you get on it and just ride it around the map, and it's always the same track. However, it became, sort of, a selling point of that mount, so if you buy a new Final Fantasy game and you see that mount you know that you'll hear that sound, that song"

He prefers iconic themes which add unity to a video game franchise to be variations of the original theme for the different, succeeding, iterations of that video game. He explains that if the iconic themes were exactly the same in a succeeding iteration he would not enjoy the video game as much and become bored of the VGM due to overuse. However, if the developers implemented exactly the same theme in a particular scene as an Easter egg (a hidden reference to the previous iteration of the video game) he would enjoy it. He believes that as long as these variations are still familiar to him he enjoys their implementation into video game franchises.

Jimmy appreciates the functional role that repeated leitmotif has when it is implemented for communicating meaning to the player. He appreciates that use of a repeating leitmotif, which he becomes familiar with when he revisits settings in a video game, where it aids and guides him, helps him with the aims and goals, and acts as a form of feedback for him. He uses the repeating leitmotif to help him with the learning curve of the game where his familiarity with the leitmotif identifies certain settings in a video game where the player has agency. He explains that in a video game a

looped leitmotif provides him with feedback when the tempo of the looped leitmotif increases, warning him that he is close to player death:

> "Street Fighter, when you're about to die the music picks up the tempo as well. You're like: 'OK then, I'm in a really sticky situation now'"

He explains that when a looped leitmotif, which changes in tempo and communicates that a timer in the video game is running out, acts as a form of feedback to him he appreciates its implementation:

> "Super Mario…that's another signal that's cued just to say, tell ya: 'Yeah, I'm getting out of time'"

He has the perspective that VGM themes, which are iconic and add identity to video games, are important for the continuity and unity of video games, and their franchises. He explains that if an iconic theme that incorporates a leitmotif, and variations of it, is familiar to him it increases his enjoyment when it is repeated in a video game or a franchise:

> "the Street Fighter franchise. Guile's theme, you'll probably hear the original one, but then you've got the Street Fighter IV version, slightly varied, using electronic devices, electronic instruments"

Max believes that the repetition of leitmotif, which communicates meaning, has a positive effect on his video game enjoyment. He appreciates the implementation of a repeating, and familiar, leitmotif when it is used in the functional role of communicating to the player that they have completed an aim and goal in a video game. He also enjoys the repetition when a familiar leitmotif, which identifies mood, is implemented as a form of feedback warning the player of danger. He discusses how a repeating leitmotif is appropriate to the scene, which aids and guides him, and focuses him. In the second interview he goes into more detail about the implementation of a repeating leitmotif with regards to identifying settings in a video game. When Max revisits settings, the familiar leitmotif appropriate to that setting acts as a form of recognition for him. The repeating leitmotif can also act as a form of feedback for him due to him hearing familiar leitmotif appropriate to that setting. In this context the repeating leitmotif helps him with the learning curve of the video game because repeated exposure to that leitmotif leads to familiarity, and he recognises that the meaning communicated to him represents safety. Max also believes that a familiar repeating leitmotif, which identifies a character, can aid and guide him in a video game. He explains that the character's leitmotif begins to play when he approaches them, which has a positive impact on his video game enjoyment:

> "I spoke quite a lot about Breath of the Wild last time and there's a character in there called Kass, and he's a musician in the game, and he's dotted around the world playing an accordion, and when you get close to him you can start to hear his music pickup"

He believes the use of repetition in the context of continuity and unity have a positive effect on his video game enjoyment. He explains that themes, which are repeated throughout his engagement with a video game, add to the continuity as he progresses and becomes familiar with the themes. In more detail, Max discusses the repetition of a familiar iconic theme, which is appropriate to a scene and incorporates a leitmotif, acts as a form of feedback about the scene. Max also has a positive perspective of when a familiar iconic theme is repeated across a franchise, which adds a sense of unity to that video game franchise. He explains that a familiar iconic theme, that incorporates a leitmotif, has been used in different iterations of a video game franchise, and has been used in the same scene appropriate way, acts as a form of feedback for him:

> "it's like the classic, the Final Fantasy battle music isn't it? And that stays similar throughout the whole series, obviously they tweak it and change it for each game, but you know what's coming when that kicks in"

He discusses how familiar iconic themes, which are repeated in different iterations of a video game franchise, create a sense of nostalgia for the different iterations of the franchise for him:

> "Legend of Zelda and, there's bits of tracks from some of the old Zelda games which I played. I remember when I was ten, eleven years old, and it's that nostalgia hit of, I dunno, I'm playing this brand new game but they've still kept their history there and I still get that same feeling I had as a kid playing those sorts of games"

Midge feels his enjoyment of video games is increased with the use of repeated leitmotif, which communicates meaning to him, because it can aid and guide him. He appreciates the implementation of repeated leitmotif, which identifies settings in a video game, especially when he likes the leitmotif. However, the repetition can cause listener fatigue due to overfamiliarity because of player delay in a particular setting.

He also enjoys the implementation of familiar leitmotif, which identifies the same setting across different iterations of a video game franchise, but can communicate a different meaning:

> "the first Diablo, the town in that, Tristram, has its own unique musical sound and as you're in there you know you're safe. The newest Diablo also has Tristram in it and you hear that again but then it's not safe, but you still hear the same music, so that was good to hear again"

He appreciates the implementation of a repeating leitmotif when it is used as a form of feedback to the player. He gives examples of his engagement with video games where he becomes familiar with leitmotifs, due to repeated exposure, and this familiarity provides him with feedback. Midge believes that this use of a repeating leitmotif increases his enjoyment of a video game and helps him engage with video games:

> "in Resident Evil, when you find the typewriter rooms, the music in those is different to the other rooms so you know it's a safe point and things. Yeah, that's really useful. In a same way that you could, I guess, in Gears of War as well, where all of the enemies are dead and the music resets to a calmer music so you know that everything is dead"

He also explains that familiarity with the leitmotif increased his understanding of its role and function in its use as a form of foreshadowing.

He is indifferent to the idea of the repetition of a theme which adds to the continuity of a video game. He has the opinion that the repeated theme should be appropriate to the scene if it is being used within the role of adding continuity to a video game. Midge does not enjoy the use of a repeating theme if it does not have this functional role, even if he likes the theme. Midge has the perspective that familiar and iconic VGM themes can add to his enjoyment of a video game franchise when they are repeated across different iterations of a video game franchise. However, this is only the case if he enjoyed that iteration of the video game, but when he did not enjoy the video game the repetition of a theme across a franchise can have a negative effect on his enjoyment. He believes that if the theme is implemented in such a way that it is appropriate to the video game genre then repetition with regards to unity has a positive impact on his enjoyment:

> "the Halo theme song is quite good, it sounds epic, like the game is supposed to be, like with how many sequels it's had and stuff, it's supposed to be this big epic shooter when it came out and the music gave it that feel, which is a good thing and I like that"

Tom A finds the use of a repeating leitmotif to be important in his engagement in a video game. The implementation of a repeating leitmotif is very useful for him where it aids and guides him, and helps him with the learning curve of the video game. Due to repeated exposure, a leitmotif, which identifies mood, becomes familiar to him and begins to act as a form of feedback for him where he recognises the familiar leitmotif, and that helps him focus.

He has the opinion that when repetition of a theme, that incorporates a familiar leitmotif, is implemented as specific feedback throughout a video game, which creates a sense of continuity for the player, the repetition of VGM helps the player with their aims and goals. He views the use of

repeated and familiar themes, which add some continuity to his engagement, as a positive use of repetition as long as the VGM is not overused. If it is overused he does admit that he will feel sated and this has an impact on his video game enjoyment. Where a repeated theme that incorporates a leitmotif has a more functional role, providing feedback, he has a more positive perspective on repeated exposure to VGM. He appreciates the use of a repeated iconic theme across a franchise because it adds a sense of unity for him across different iterations of that video game franchise:

> "Halo, for example, if you've been playing since the first game, and you've been a loyal Halo fan, as soon as you hear that music it reminds you: 'Oh, another Halo'. You relate to it, you go, it can help you look forward to it"

He believes that familiarity with certain iconic themes that are repeated in iterations of a video game franchise improve the enjoyment of that franchise, add some identity to a video game, and are expected by players of that franchise. He thinks that the use of repetition in this context can help players engage with video games and can help the developer sell the downloadable content (DLC) for a game.

Tom P appreciates the implementation of a repeated leitmotif when it communicates meaning to him, which aids and guides him, and focuses him in a video game:

> "Tomb Raider, for example, the music normally changes and stuff so you know in that slight change that you're near a secret area, so maybe you have to look a bit more closely to the environment, so in that respect the music gives a player the guidance towards something that they might find intriguing"

He believes that when he becomes familiar with a certain leitmotif, which is repeated, the familiar leitmotif can help with the learning curve of the video game and acts as a form of feedback to him about a scene. This improves his engagement with a video game:

> "for example, something like Dark Souls if the music changes but you can't really see an enemy you know that there's something nearby so it does help out the user"

He appreciates the implementation of a familiar repeated iconic theme, which adds to the continuity of a video game. His experience of its use in this role is mostly positive but he can also be indifferent to it. However, he does have the opinion that it can be used more in a positive role if it is implemented to a high standard and believes that it can have a positive impact on his enjoyment of a video game. He is more positive when it comes to a repeated theme adding a sense of unity across a video game franchise. He believes that a familiar iconic theme adds identity to a video game, which creates and sustains a brand for that video game franchise:

> "in some game franchises like Pokémon, for example, the battle music is actually quite, it's defined quite well, and it's one of those things, it's almost of a certain generation, it's recognised almost instantly because of it"

He feels that familiar iconic themes can also can also improve the player's enjoyment of that franchise and their engagement with an iteration of a video game of that franchise. He believes that iconic themes have the potential to move beyond engagement and can be can be used by developers as tools to remind players of the franchise due to their familiarity with the iconic themes.

Tom W believes the implementation of a repeating leitmotif is a positive phenomenon and can be important to his engagement. He understands and appreciates why developers implement VGM repetition in a functional role with regards to player feedback. He discusses leitmotif, which is used as a form of feedback, warning the player of a change in the scene. He explains that familiarity with that certain leitmotif motivates him and he perceives this to be a positive use of repetition. He appreciates the use of a repeating leitmotif, which identifies settings in a video game, where he recognises a familiar leitmotif attached to a revisited setting. He explains that a piece of leitmotif which loops until the player has completed an aim and goal can provide feedback, aid and guide, and focus the player. He believes that the repetition is not annoying or intrusive because the player is concentrating on the gameplay and the VGM in that context.

He thinks that his enjoyment of a video game with regards to VGM repetition depends on the implementation of a theme. He explains that consistent genres of VGM themes, which are used throughout the video game, adds to the continuity of the video game. He finds that some genres of VGM are more boring, and he finds them more tedious than others when they repeat, as he progresses through a video game. He also enjoys a video game where the themes are appropriate to the video game genre but are interspersed with different genres of VGM which do not fit the video game genre:

> "Divinity: Original Sin has got quite a pleasant medieval sounding soundtrack but when it comes to combat it does break into heavy metal. I think that has a lot more, much more pumping track"

He believes that these different themes are appropriate to the specific scene he is playing and that they help him identify with the hero.

He discusses how an iconic theme can add a sense of unity to a video game franchise. He thinks that when the theme is iconic and familiar to players, then their enjoyment of that video game franchise increases. He likes the iconic theme to remain familiar but also believes that variations of the iconic theme should be used across different iterations of a video game franchise:

> "a good example of this is World of Warcraft's main menu music I think, changes every expansion, and that's got such a solid presence they can really do a lot to change it but the core part of the motif is there"

He believes that these variations can communicate different meanings to him through the use of implemented leitmotifs across iterations of a video game franchise.

Finally Vlad also has positive experiences with repeating leitmotifs, which communicate meaning to him in a video game. He has the view that if the VGM is functional, where leitmotif is used as a form of feedback to the player, then he is tolerant of the repetition. He appreciates the implementation of a repeating leitmotif, which identifies settings in a video game. He explains that the repeating leitmotif aids and guides him as it identifies certain settings, and his position in a video game:

> "I remember playing Gothic 3, or something, and there was the sand region, kind of, theme, right?...it's really easy to get lost in that game cos the mini-map doesn't track your current position. So in that case that helped a lot"

He prefers the leitmotif to be variations when they repeat and be of high complexity because he explains that overfamiliarity with the repeating leitmotif can cause listener fatigue. He understands that overfamiliarity can make the leitmotif disliked but explains that players learn to tolerate the repetition because it has a functional role. However, he believes that the leitmotif should still remain familiar to him so that the communication of meaning should be consistent, which helps players with the learning curve of the video game. Vlad also discusses his experience of a repeating piece of leitmotif and explains that repeated exposure to that leitmotif becomes familiar to him as a specific kind of feedback warning him of danger. Ultimately, Vlad feels that a repeating leitmotif, which provides him with feedback, is functional and he expects it to be implemented:

> "playing Doom, or something, you need it there cos it warns you that: 'Oi! You're gonna get massacred dude, you better run away', right?"

He believes that an iconic theme, which is repeated throughout his progression in a video game, adds to the continuity of that video game as he becomes familiar with that iconic theme. However, he thinks that the iconic theme should only be repeated in appropriate scenes otherwise the iconic theme can be contradictory to that scene:

> "I've listened to a lot of Halo music…[w]hen I play the games you get some random events happening, so you go from a bunker, or something, and it's your average thing, and you hear this grandiose music right there, and you're like: 'OK, so I get it, I get it'. It's not like when you actually see the Halo rings, or something, right?"

He also discusses unity and iconic VGM themes, where he has the experience that familiarity with certain themes throughout different iterations of a video game franchise sometimes means that those themes become iconic. He says that there is an expectation from players for those iconic themes to be present in succeeding iterations of a video game, and when they are not it can have a negative impact on those players' enjoyment of the franchise, even if the VGM is of good quality:

> "WoW basically has the same opening soundtrack and it's had it for a while, right? And they mix it up, so when they changed it in Cataclysm people where ******* mad, they lost it, they went bonkers"

He believes that when certain iconic themes are repeated in later iterations as Easter eggs, they can have a negative impact on the players' video game enjoyment if they are not exactly the same iconic themes.

Video Game Scene and Genre Appropriateness

Daniel is appreciative of the repetition of VGM when it is appropriate to the scene. He discusses a video game, which he has replayed multiple times, where a variation of a repeating leitmotif, which identifies characters, narrative, and mood, is implemented every time he is in a scene with a particular character. The leitmotif communicates meaning to him in the form of different aspects of the character's narrative every time it is repeated when Daniel re-enters the scene:

> "in Nier: Automata there's that robot called Pascal, his story is really, really, sad and every time you have a quest you're walking with him somewhere it's a similar theme, it's kind of different"

He explains that when the VGM is inappropriate to the video game genre and he dislikes specific VGM pieces he is still tolerant of them. However, if the entire VGM soundtrack is not appropriate to the video game genre and he dislikes the entire soundtrack he will replace it with his own user-selected playlist.

Jimmy explains that he is more tolerant of the repetition of VGM when it is appropriate to the video game genre. When it is not appropriate the repetition of VGM has a negative impact on his video game enjoyment. However, if the developers intentionally implement inappropriate VGM in a video game as a design choice then Jimmy appreciates the use of the inappropriate VGM, and believes that the repetition of this inappropriate VGM does not have a negative effect on the enjoyment of that video game.

Max explains that VGM repetition with regards to his video game enjoyment depends on whether the VGM is appropriate to the scene. He continues that when the VGM is appropriate his enjoyment of a video game increases. He also believes that VGM should be appropriate to the video game genre and that the repetition of inappropriate VGM has a negative impact on his video game enjoyment. He disconnects with the video game when an inappropriate VGM genre is repeated and believes the repetition of inappropriate VGM disengages him from a video game. The opposite is true for him when appropriate VGM which fits the video game is repeated, he feels more immersed and feels more engaged with that video game:

> "Breath of the Wild, and those epic, instrumental music, orchestral sort of stuff, coming on in the background. It gives you that feel good, I've accomplished something, vibe to it and, I think, it being such an open world, the music lends itself to that"

Midge has a positive opinion of VGM repetition when the VGM is appropriate to the scene, which increases his video game enjoyment:

> "Total Inhalation, it's a few years ago now, and that had a classical score that changed as combat started but if you stayed out of combat long enough the score would just repeat, and that never got negative for me"

He can appreciate the repetition of VGM when it is appropriate to the scene, is familiar with the repeating VGM, and understands its implementation when he re-enters scenes:

> "Vampires: The Masquerade, going for a different game, has, there's a dance club you go into, the music is, it's super crappy, I'm really not a fan of it, but it fits the situation and every time you go back into it that the music is there"

In a different example he discusses how licensed music is implemented and repeated in specific scenes, which add to the realism of a video game. In these situations if he is overfamiliar with the licensed music the video game allows him to change the licensed music. However, in video games that do not allow him to change the VGM, but are appropriate to the scene, he is more tolerant of the VGM repetition because it fits the game events and makes sense to him:

> "GTA for instance, when you listen to the radio…there are certain songs that come on and you're like: 'I've heard this a million times already', and you're just like: 'Right, next song'…that's like a bit of immersion in the game cos they've got radio and things…whereas, if you are in a dance club you were expecting to hear dance music"

He is tolerant of the repetition of VGM when the VGM genre is appropriate to the video game genre, but also enjoys a video game when the developers purposely use an inappropriate VGM genre in a specific scene. He enjoys it when an inappropriate VGM genre is implemented into a scene in a video game, which he believes is appropriate to the context of that scene, and because he appreciates this use he is more tolerant of the repetition of the VGM:

> "say Final Fantasy VII, you've got the summons that you bring in and if you summon something in, like the God of Thunder, or whatever, and he came down with a guitar, and the amusement, I think, would offset the change in music"

Generally he believes that the VGM genre should be appropriate to the video game genre.

Tom A explains that his video game enjoyment with regards to the repetition of VGM is dependent on the genre of music and its implementation. Generally he believes that the VGM should be appropriate to the video game genre, and specifically the scene. He gives an example of a couple of video game genres where he believes that the repeating VGM should be appropriate to the scene, which improves his enjoyment of those video game genres.

> "say I was playing a game, an action game, so to speak, or a first person shooter. I'm not expecting music such as Oasis or Nirvana to come on…if the music doesn't really fit into the game you're playing it can be a down point, and it can stop me enjoying a game because I'm like: 'It doesn't really mix'"

He discusses that when it does fit, the VGM fades more into the background for him rather than standing out. He explains that when the VGM is appropriate to an intense scene the VGM should also be equally intense, and he is tolerant to the repetition of VGM in that context. He thinks that if inappropriate VGM is looped and repeats it causes overfamiliarity, he becomes sated, and annoyed with it.

Tom P discusses how the repetition of VGM impacts his enjoyment of video games is dependent on the genre of video games, and perceives both a positive use of repetition, and a negative. He is more accepting of VGM repetition when the VGM is appropriate to the video game genre:

> "you wouldn't expect Techno Rock in Skyrim, kinda thing, you expect the, kinda, orchestral, vocal, background music because it adds ambience, and it builds into the actual lore, and gameplay, of the game"

He believes that his continuity, flow, and immersion improves when the repeating VGM is appropriate to the video game genre. He explains that even if he does find the repetition irritating he is more

tolerant of it because it fits with the narrative, gameplay, and aesthetic of the video game, which suspends his disbelief:

> "for example, Far Cry 3: Blood Dragon uses a lot of 80's iconography and stuff like that, 80's style music for that would be fine for me but what you wouldn't expect is 1940's Hip Hop Jazz, kinda thing, because it breaks the continuity and it breaks that bit of immersion"

He is more aware of the repetition when the VGM does not fit the video game and believes that the repetition is contradictory to the video game when the video game genre, and the VGM genre, are inappropriate. This can irritate him especially when the VGM is looped because the repetition becomes obvious. With regards to indie games, where VGM can be implemented in an incorrect way due to a lack of planning and resources, repetition irritates him and has a negative impact on his enjoyment of a video game.

Tom W believes that repetition of VGM, which is scene appropriate, has an important role and function in video games. He appreciates the implementation of VGM, which is appropriate to the scene, and has the opinion that it helps him identify with the hero, that it focuses him, aids and guides him, and identifies moods for him when it is used as leitmotif. When discussing if the VGM repetition means that he avoids certain scenes in a video game because they may have a negative impact on his video game enjoyment, he explains that he does not try to have a negative opinion of repeating VGM because it has a negative impact on his engagement of video games.

He enjoys a video game when the VGM is appropriate to the video game genre and is more accepting of the VGM repetition. He views repetition of appropriate genre VGM as an important part of his video game enjoyment and engagement:

> "for instance, like, Splinter Cell, and that has quite a, like, a lot of low style music for ambient, sneaky, tracks and that's repeating over, and over. That has a really great feeling to it cos you get the feeling of, like, secret agent over, and over"

He elaborates a little bit more later on in the interview, and has the opinion that when the repetition of a genre of VGM is consistent with the video game his enjoyment of that video game increases, giving an example of an FPS game:

> "Doom is a good example to put here because, I haven't played a lot of it to be perfectly honest, but I know a lot of the tracks are very heavy. That style is repeated throughout and I think that fits it"

Vlad has a positive experience of the repetition of scene appropriate VGM with regards to his video game enjoyment:

> "I remember in Skyrim, yeah. They have those specific northern instruments and such, they make music feel icy, you know? You actually feel the chill of the area"

He is more tolerant of VGM repetition when he believes that the VGM, which is appropriate to the scene, is then replaced with another piece of VGM when the scene changes. He believes that the repetition of VGM should be appropriate to the video game genre where the video game genre can dictate the amount of repetition implemented. He explains that the genre of video game also should be considered when developers are implementing looping into a video game. He has the opinion that shorter gameplay means that the player engages with that video game for shorter periods of time, and that less complex VGM can be looped in those genres of video game. However, for video game genres that are played over longer periods of time the repetition of VGM can have a negative impact on the player's immersion.

Player Delay

Adam H discusses situations where player delay causes the VGM to be repeated, due to looping, where it can act as a form of feedback to him when there is no visual clue that the scene has ended. In these instances the repetition of VGM aids and guides him, helps him with the aims and goals of the video game, and warns him that he still has enemies to kill. The repetition of VGM has a functional role for him in this context and he perceives it to be a positive phenomenon, which increases his enjoyment of a video game. However, in some situations the repetition of scene appropriate VGM due to player delay can be a negative phenomenon for him. The VGM repetition due to player delay in certain scenes, when he cannot visually identify how to complete the aim and goal of that scene, can have a negative effect on video game enjoyment, where looping of the scene appropriate VGM can irritate him. In these scenes he feels that his disbelief is not suspended and feels frustrated that he cannot progress, but he understands the functional role of the repetition. His solution are timing cues so that the VGM is not looped indefinitely and fades to silence.

Alice also believes that scene appropriate VGM which loops and repeats due to player delay is important feedback for her. She explains that the scene appropriate VGM, which is constantly looped until the aim and goal of that scene is completed, is a positive phenomenon for her because it provides her with feedback. However, in situations where the video game is malfunctioning the repetition can be a negative phenomenon for her.

Daniel believes that the VGM complexity can also be a factor with regards to player delay and VGM repetition. He prefers scene appropriate VGM which is higher complexity when he is delayed in a scene and the VGM is looped; low complexity VGM which is looped bores him unless it is liked when he is delayed in a scene.

Jimmy has the perspective that his enjoyment of a video game when scene appropriate VGM is looped due to player delay depends on the amount of time spent in that scene. He generally appreciates the functional role of looped VGM when he is delayed in a scene and comments that it acts as a form of feedback to him, it aids and guides him, focuses him, and identifies mood. However, he explains that when he is stuck in a particular scene he notices repetition of VGM, which annoys him, and he ends up turning the VGM off.

Max has the perspective that the way scene appropriate VGM, which repeats due to player delay, is implemented is important for his video game enjoyment. He appreciates the functional role looped VGM has due to player delay where it acts as a form of feedback to him, which aids and guides him. However, he feels that sometimes the way VGM is implemented in this context can be patronising and reveals too much information about the scene. He prefers a timing cue which fades the looped VGM to silence until a game event or his player activity cues the VGM again.

Midge has a positive opinion of the use of repetition when he is delayed in a scene because he believes it provides him with feedback. He gives an example of an adaptive/dynamic VGM system that loops the VGM in a scene and varies the VGM in such a way that it aids, and guides, the player providing the player with feedback. He appreciates the implementation of such a system and the use of looped VGM because the audible change in the VGM helps him to engage with the video game, which increases his immersion:

> "L.A. Noire did it as well, when you're looking for clues. I mean it's kind of, it's their detective vision, I guess, in the game, it's the music clues, because your person knows when all of the clues have been found because the music changes"

In a second similar example he discusses the use of a looped piece of VGM, which is appropriate to a specific scene. In this example a change in the looped VGM signifies that he has completed the aim and goal of that scene, which acts as a form of feedback for him.

> "with Gears of War there's, some of the map areas are quite big that you fight in, and the quick audio change means that you don't have to scan the rest of the map looking for other people, you know that you've ended it, and you're like: 'OK, brilliant!'"

Tom A usually does not view looping and repetition of VGM due to player delay as a negative phenomenon because the VGM is in the background. However, when he is sated with the scene he is delayed in, or with the VGM, then it has a negative impact on his video game enjoyment. He discusses times when he is repeatedly replaying specific aims and goals in a video game due to player death. He says that during these scenes if the VGM has a slow tempo, or is more downbeat, he loses focus and finds the repetition to be distracting. However, the opposite is true when the VGM is a higher tempo and is more upbeat. He finds that the repetition of this kind of VGM increases his motivation to complete the aims and goals, and he is more focused with his engagement. When the VGM is acting as a form of feedback to him in a delayed scene he is more positive of its implementation, and believes that the repetition of VGM, which is appropriate to the scene, increases his video game enjoyment. However, low complexity VGM, which is looped in scenes where he is delayed for long periods, bores him due to overfamiliarity.

Vlad discusses that the implementation and technological constraints also impact his video game enjoyment with regards to VGM repetition, and player delay. If the video game is malfunctioning and the VGM is not appropriate to the scene he is aware of the repetition more. He views this as a design issue with regards to implementation, however, he understands that this can also be due to technological constrains.

Adaptive/Dynamic Music

Adam H prefers adaptive/dynamic music in certain genres of video games that include action and combat. He explains how different scenes have appropriate leitmotifs attached to them and discusses what they communicate to him. He explains that when scenes change the VGM should react appropriately to the scene because it provides him with feedback.

Alice is tolerant to adaptive/dynamic music, but she explains that her opinion of it depends on the genre of the video game and whether she is engaging in a multiplayer game. In multiplayer games, Alice prefers to either mute the VGM or employ her own user-selected playlists because of the amount of time she invests into those video games.

Max has a positive opinion of adaptive/dynamic music and appreciates its implementation in video games, where he believes its use improves his video game enjoyment. He believes that adaptive/dynamic music increases his enjoyment of video games because the adaptive/dynamic system is more flexible than the earlier interactive music systems, which only used cued VGM that was triggered by changes in the scene. He explains that this gives him a feeling of control, agency, and

provides him with feedback but at the same time does not provide him with excessive information, which can interfere with his engagement.

Midge discusses that he prefers adaptive/dynamic music compared to constantly looped VGM, which can be considered as traditional, because it is able to react to the scene. However, he is tolerant of the implementation of constantly looped VGM when it is appropriate to the genre of video game, even if he is overfamiliar with the VGM due to repeated exposure.

Tom A believes that adaptive/dynamic music is a more functional approach and technique compared to continuously looped VGM because it is appropriate to the scene, and prefers adaptive/dynamic music because it is reactive, and flexible, compared to looped VGM. He explains that adaptive/dynamic music is more appropriate to the scene and that it can identify the mood in a scene through the implementation of leitmotif. He also believes that adaptive/dynamic music can reduce the repetition of VGM because the VGM is not constantly looped.

Tom P believes that the implementation of adaptive/dynamic music should be dependent on the genre of video game. He understands that it is impossible to create a linear soundtrack for modern video games and that repetition of VGM is inevitable. He discusses that the costs of creating unique VGM for every scene in a video game are very high with regards to the time and effort required, and the financial cost involved. He explains that players appreciate this and that if the VGM is liked, then it should increase the players' video game enjoyment. He appreciates looped VGM in indie games because he believes that the approach and technique used is appropriate to those video games. However, he expects adaptive/dynamic music systems, such as one which implements scene appropriate leitmotifs, which repeat and provide player feedback, in modern AAA video games. He explains that as long as the VGM repetition does not irritate and disengage the player then it has a positive effect on video game enjoyment.

Tom W has a positive view of adaptive/dynamic music and believes that the implementation of adaptive/dynamic systems improve video game engagement, and the VGM.

Vlad discusses variation and adaptive/dynamic music, which can reduce, conceal, and remove repetition while keeping the familiarity of the VGM. He can appreciate the use of such a system because it can continue to provide player feedback when he is familiar with a scene appropriate leitmotif, and still employ variation in that leitmotif, which reduces the repetition of that leitmotif.

Background, Catchiness, and the Non-Memorable

Adam H is more appreciative of repetition when a catchy VGM is liked. He also appreciates the implementation of VGM, which is not catchy, by the developers in order to reduce and conceal the

VGM repetition. However, he is less tolerant of VGM repetition when the VGM is not purposely catchy and explains that it makes the repetition stand out because he dislikes the VGM. He prefers catchy VGM and explains that if the VGM is catchy it is easier for him to become familiar with the repeating VGM, which increases his liking for the catchy VGM.

Alice believes that if the VGM repetition is implemented so that the VGM is not in the background it has a negative impact on her engagement. She discusses the approaches and techniques of keeping VGM in the background, using non-memorable melodies, and implementing VGM which is not catchy. She believes that the approaches and techniques are dependent on whether she likes or dislikes the catchy VGM when it is repeated. She explains that if the VGM is disliked and is catchy it has a negative impact on her video game enjoyment. She does not have a problem with VGM which repeats and increases her awareness of repetition due to catchiness, especially if she likes the VGM.

Daniel has the perspective that VGM, which remains in the background, is non-memorable, and not catchy, in order to avoid the player noticing the repetition may not be a problem if implemented appropriately. He explains that the catchiness of VGM should be appropriate and discusses a musical soundscape, which he prefers to be non-memorable, because he believes that that kind of VGM should not be catchy. He believes that repeating VGM leitmotifs, which identify moods, provide him with feedback, and are appropriate to the scene, do not have to be catchy because that is not the functional role of that VGM. However, a repeating leitmotif, which identifies settings, can be catchy because the VGM can be iconic, which gives identity to a video game. The familiarity with the catchy leitmotif can also act as a form of awareness for him when he engages with a video game after some time away from it:

> "I didn't play World of Warcraft for really some time, it's been a few years, however, every time I hear three seconds of that soundtrack from the main city I can remember the whole thing, and it's so well made, it's so catchy"

Ultimately he does not perceive catchiness to be a problem.

Jimmy discusses his perspectives on the use of non-catchy and non-memorable VGM, which is implemented in the background to reduce and conceal VGM repetition. He believes that the genre of video game dictates whether the repeating VGM should be catchy or non-memorable. He prefers a non-memorable approach when he is engaging with a massively multiplayer online role-playing game (MMORPG) due to the size and the time invested in those genres of video game. In those genres of video game he can experience satiation and listener fatigue due to overfamiliarity. However, in certain

scenes he prefers catchy VGM which is scene appropriate and identifies moods, which aids and guides him, and can focus the player.

Max explains that the approaches and techniques used to conceal, and reduce, repetition of VGM such as the implementation of non-memorable melodies, and non-catchy VGM, is something that he has not thought about much. He discusses that there is some VGM that he remembers because he liked it and because he enjoyed that video game, and that his opinion was dependent on his engagement. He explains that he can appreciate why developers use approaches and techniques such as implementing non-memorable melodies because the VGM repetition can become noticeable in some video games:

> "Breath of the Wild, the music in the background is so subtle and so quiet, and in some places non-existent, it just gives us little bits popping through as you look around, and it really makes the game feel bigger than it probably is"

However, he believes that VGM which is catchy and yet disliked can disengage players when it repeats.

Midge believes that the implementation of non-memorable melodies, and purposely avoiding catchy VGM, are not useful approaches and techniques, and should not be used to conceal or reduce the repetition of VGM. He explains that memorable and iconic VGM themes can be implemented to add identity to a video game, and that the memorable VGM can become familiar with the player:

> "for instance the Halo soundtrack, you hear it and you immediately think of Halo because it's unique to it"

He believes that certain catchy and appropriate licensed music can make his engagement more enjoyable:

> "Saints Row III even, I think…you're saving someone at the end and there's the Bonnie Tyler song 'Holding Out for a Hero' going on, and that song's catchy but that, I fully enjoyed that, like, that added to the game at the end"

Later on in the interview he discusses his views on keeping VGM in the background with regards to repetition, and prefers the VGM to remain in the background because he believes that the VGM is not the focus of his engagement. However, in certain situations he appreciates the VGM becoming more incorporated into the actual gameplay of a video game, such as rhythm games, and gives an example how a repeating melody is used as a gameplay device to progress through an online FPS game by the player:

> "for instance Warframe, they've added in the very recent update, where they've got a musical frame in it and to unlock the components for it you need to do this melody, and you need to, so there's parts of it where you actually need to listen to the music, like actively listen to it as you're doing it"

Tom A explains that the implementation of non-memorable melodies and non-catchy VGM can decrease the repetition of VGM, but can have other impacts on the familiarity of the VGM. Sometimes he prefers catchy VGM which repeats and sometimes he does not, instead preferring non-memorable VGM. When the VGM is catchy he explains that the VGM can become familiar and iconic. He has the opinion that in certain scenes the VGM should be appropriately catchy, while in others it should be appropriately non-memorable.

Tom P appreciates the approaches and techniques of implementing non-memorable VGM because he believes that certain catchy VGM can be overused, which means the player notices the repetition more. He also believes that in those circumstances the player can become indifferent to the VGM and can tolerate the repetition. However, he gives an example of a repeating leitmotif which is catchy and iconic, and believes that the VGM can add identity to a video game because of its catchiness:

> "a game called Borderlands: The Pre-Sequel…I can remember there's a specific song in one of the DLCs to do with one of the characters called Claptrap and it's '(Size of Your) MainFrame', and that song for me is very recognisable cos it's got a very unique beat, and stuff"

In another example, he discusses a video game which is recognisable because of the familiar and memorable VGM, and explains that memorable, and catchy, VGM can add to the enjoyment of those video games:

> "Skyrim, for example, that keeps just getting re-mashed every year, remastered. Then putting something that's easily recognisable wouldn't be a negative because, maybe, they'd want the player to hear the music"

Overall he thinks that VGM should remain in the background, which helps to conceal the repetition, but also believes that it should be liked, which helps players engage with the video game. In the second interview he elaborates on this, and believes that if the repeating VGM is appropriate to the video game genre then it does not have to be in the background. He explains that non-memorable VGM can reduce and conceal the repetition because players notice it less, and are irritated less by the repetition.

Tom W has the perspective that VGM does not have to remain in the background, be non-memorable, and that it can be catchy because he believes that VGM has an important role within video games,

and does not have to be implemented in such a way that it is confined to the background. He appreciates the reason that non-memorable VGM is implemented but prefers memorable and catchy VGM because he feels that it adds to the identity of video games, even when the VGM repeats. He believes that the implementation of non-memorable VGM can lead to dull, forgettable, and emotionless VGM. However, he can appreciate the implementation of non-memorable VGM in appropriate scenes where there is slower gameplay, but in scenes that require an iconic theme he prefers catchy and memorable VGM.

Vlad explains his experience with non-memorable melodies, catchy VGM, and whether the VGM should remain in the background. He appreciates the implementation of non-memorable VGM, which remains in the background, and explains that it is video game genre dependent. In video games that have a lot of player agency he prefers the VGM to remain in the background and not be catchy because it should be appropriate to that video game genre, which suspends his disbelief. He believes that if a catchy piece of VGM is implemented into that genre of video game it should be appropriate to the scene and used to improve engagement. In another example, he discusses an FPS game and explains that catchy, and memorable, VGM is more appropriate to that genre of video game:

> "Bioshock Infinite, where they use old tunes, right? Remastered to seem like old school and stuff, and in the background you can ******* hear them but they were fine cos they were old, iconic tunes, and people were OK with that"

Also, he has the perspective that in certain action orientated game genres, the VGM does not need to remain in the background and can motivate players. Ultimately he believes that the implementation of non-memorable or catchy VGM depends on the genre of video game, which can improve his engagement.

Silence and Foreshadow

Adam H prefers VGM to be constantly looped compared to silence because he prefers some form of VGM to be present when he is engaged with a video game. He can find that when the VGM fades to silence it can be irritating, but he does appreciate the implementation of silence when it is used as a form of foreshadowing. He explains that when silence is used in that context it can have an important and positive impact on his engagement.

Alice also believes that silence is more useful in its role as foreshadowing scenes in a video game, and she thinks that silence can be a good approach, and technique, used to reduce looping of VGM in video games. However, she believes that silence used as a form of foreshadow is a better use for it and explains that in certain video games silence can have this important functional role.

Daniel discusses how silence can be implemented within interactive music approaches and techniques where the scene appropriate VGM is cued, and fades out, after a certain amount of time, until a new piece of VGM is triggered when the scene changes. He explains that the VGM will fade out into silence and he will hear only the sound effects of a video game:

> "the World of Warcraft example, after entering the city after the music stops, finishes, it's not played over again but there is some kind of nothingness. Let's say, maybe, crickets"

In that example, where he believes silence to be appropriate to the scene, silence is something that increases his enjoyment of video games and his engagement.

Jimmy discusses his views on looped VGM compared to an interactive music system, which implements silence to reduce the VGM repetition. He appreciates both looped VGM and VGM interspersed with silence approaches. He believes that it is dependent on the scene, specifically his player activity. He explains that when he is focused on a scene that he finds engaging he prefers silence because he finds the looped VGM distracting, disturbing, and intrusive. However, if he likes the VGM he is more tolerant of the looped VGM. In other scenes he prefers looped VGM which plays in the background. He discusses looped VGM that provides him with feedback through the use of a leitmotif, which identifies settings and mood. He believes that this looped leitmotif, which can be low complexity, non-memorable, and is appropriate to the scene, increases his engagement because he uses his familiarity with the looped leitmotif as a form of feedback, which helps with the learning curve of the video game. He also believes that VGM repetition in this context improves engagement in certain video games, such as virtual reality (VR) games.

Max views repetition of VGM in certain scenes to be a positive phenomenon and he discusses VGM repetition in scenes where the game events and player activity is not intense. Max explains that in certain scenes which have less gameplay involved he prefers to hear just the sound effects of the video game:

> "I loved sitting in Zelda when there's no fighting going on. I was just walking around, looking around, and all you could hear was the trees rustling or the birds in the background, and it made it feel epic"

He believes that this approach improves his engagement and the technique is appropriate to those scenes, which increases his video game enjoyment. He discusses that as his presence increases, he feels more immersed with the video game, and his disbelief is suspended. In the example he discusses, he explains that he can still hear little moments of VGM in the background from time to time but not enough for him to register the VGM:

> "I loved that quiet feeling of just walking around, exploring, foraging for foods, and stuff, just the natural sounds of the world with it. It really engaged you, you invest in it"

In other scenes, which involve him to stay focused, he prefers VGM to be constantly playing in the background because it motivates him to stay engaged. When he is exploring the environment of the game world he prefers the VGM to be in the background and be non-memorable. His video game enjoyment and engagement increases when silence is implemented into video games, which can motivate him.

Midge does not view silence as a form of VGM repetition reduction but does appreciate its role as a form of foreshadowing in video games. He believes that silence can increase tension and suspense in video games instead of reducing the repetition of VGM, and that silence used in that role can increase his video game engagement:

> "Resident Evil, as you're opening a door the music stops, the loading screen starts as the door opens then you go in and it's like: 'What's gonna be in here?' The music's back on now, like: 'Oh, safe area', or like: 'Boom! Enemies in here'"

Tom A explains that he prefers looped VGM to be constantly played in the background when he is engaged with certain video game genres. He believes that the looped VGM helps to focus him and motivates him to remain engaged with a video game, that silence could bore him, and that looped VGM helps him to enjoy video games.

Tom P discusses his perspective on the implementation of silence in scenes where the gameplay is less. He believes that silence has a more important role within certain video games where it can identify mood and act as a form of foreshadowing:

> "the Dead Space series, if you hear dead silence you start getting a bit un-nervy, thinking something, so it's building tension"

He explains that silence can be used to convey a sense of tension, fear, and anxiety in video games, such as horror games, where he has the most experience of its implementation. He perceives that silence can be jarring when not implemented correctly in video games, but as long as it is appropriate to the scene and genre of video game it can add to his video game enjoyment.

Tom W believes that silence can be a good approach and that interactive music can be a helpful technique when he is in appropriate scenes. He appreciates silent scenes in video games where he can only hear the sound effects because it can help create a mood. He also understands the

implementation of interactive music, which will trigger VGM when the scene cue changes, where the VGM can provide him with feedback.

Vlad believes that silence can play an important role after a big scene or after moments of intense gameplay. He explains that after such scenes he prefers silence because it helps him to calm down and enjoys it when the VGM starts to fade in when he moves on to the next scene. He also appreciates the role of silence in a functional perspective where it is used as a form of foreshadowing, which provides him with feedback about an upcoming intense scene:

> "in Amnesia…there's a moment where you hear only ambient sounds and you're like: 'Oh, this is a bit weird', and then you hear the monster track, and you're scared ********, and you run around, and then you get away from the combat phase, again it moves onto silence and ambient sounds"

Variation

Adam H is tolerant of variation of leitmotifs but prefers familiar leitmotifs which provide him with feedback:

> "in Final Fantasy they have fight music, but they also have boss fight music and when you go into a fight, and you hear that different song played…I get a little bit more tense because I'm getting feedback from, I guess the game's saying: 'This ain't a normal fight, this is gonna be hard', or: 'This is something special'"

He discusses that in certain genres of video games, such as FPS games, he appreciates the familiarity he has with repeating leitmotifs and that variation may remove that familiarity:

> "assume you started running to a load of enemies whilst you're holding a shotgun, Doom is my, I guess, my easiest example, you always hear the exact same thing every time"

However, he does not have a negative opinion of variation.

Alice explains that she appreciates the implementation of variations of leitmotifs, which provide the player with feedback, as long as the communication of meaning remains intact. She understands that variation reduces repetition of VGM, which can annoy her, but feels that the implemented variation should not remove the functionality that a repeating leitmotif can have with regards to player feedback.

Daniel appreciates the implementation of variations of leitmotifs as long as the communication of meaning is still present in the variations:

> "I started playing Nier: Automata and there's that, kind of, exactly that kind of thing, so I really like that type of repetition of music because it's still the same piece of soundtrack but what they did is, there are three or four versions of it so there is still the same basic theme but sometimes it had chorus in it, sometimes it has some additional layer on it so it's not that repetitive"

He discusses that variation can be a useful approach and technique used to reduce VGM repetition as long as it is not overused. He explains that repeated exposure to a small number of leitmotif variations, which all communicate the same meaning to the player, can still provide the player with feedback when the player becomes familiar with the variations. He can become bored with repetition of a leitmotif and variations help reduce that repetition while still providing him with feedback. In the second interview Daniel explains that when the implemented variations are liked, they are appropriate to that scene, and communicate meaning to him the variation adds to his video game enjoyment.

Jimmy appreciates the implementation of variations of themes and believes that as long as the themes are familiar, the variation can be something to look forward to. He believes that variation improves his video game enjoyment and gives an example of a video game that implements an iconic theme, which uses variation to create different versions of the theme, while still remaining familiar to him. He likes the variation and understands how it could be implemented, and ultimately he anticipates variations of the theme:

> "Final Fantasy IX, that melody at the start of the game, it gets played around five times, different tunes from having a flute on, from piano, bass, everything. You welcome it, it's something new…you still get that melody, you know that tune…you would welcome it, like: 'Yes, I know this song but this is a new variation'"

Max discusses the use of variation of a leitmotif, which identifies moods and provides the player with feedback. He explains that the concept of variation appeals to him and he believes that the cost of implementation of the variations would be low. He discusses that variation is a good approach because it can still communicate meaning to the player without leading to overfamiliarity with a leitmotif. However, Max believes that too much variation could hinder player feedback because the player may not become familiar with a scene appropriate leitmotif, which communicates a specific meaning to them. Essentially Max believes there should be a balance between familiarity and variation.

Midge discusses variation of a scene appropriate leitmotif that provides the player with feedback, which is dependent on the functionality of the leitmotif. He explains that the implementation of

variation depends on the complexity of the VGM and its functional role within the video game. He prefers variation when the VGM is of low complexity. However, for higher complexity VGM, which provides the player with feedback, he believes that variation can become confusing for the player who associates that VGM with a specific communication of meaning. He discusses VGM, which is more functional and has a specific role, and explains that variation can have a positive impact on video game enjoyment, but ultimately he believes that variation should not hinder the role and function of familiar VGM, where VGM repetition can provide feedback to the player.

Tom A believes that the approach and technique of implementing variation into video games increases his video game enjoyment because it helps to focus the player, it stops the VGM becoming overfamiliar, and it varies the engagement.

Tom P appreciates the implementation of variation of themes and leitmotifs, and believes that it improves his engagement. He prefers variation because he can become overfamiliar with the VGM, which can cause listener fatigue for him. He explains that overfamiliarity can cause a disconnect for him with his engagement, but variation can help him focus and motivate him while keeping him interested in the VGM.

Tom W has the perspective that the use of variation can improve his video game enjoyment with iconic themes. He explains that variation can create a different mood or atmosphere in a scene while keeping the theme familiar. He enjoys the implementation of variation because it keeps the VGM interesting.

Vlad discusses that variation can be a good approach and technique used to reduce, and conceal, VGM repetition but as long as it does not hinder player feedback. He explains that variations of a leitmotif can hinder the familiarity that the player has with the leitmotif, which can diminish its function as a form of player feedback.

User-Selected and Licensed Music Playlists

Adam H explains that he used to use user-selected playlists but finds that his own playlists interfere with his performance and engagement. He finds that user-selected playlists distract him due to his familiarity with his own liked music, and he prefers not to use them so he can focus on the video game where the in-game sound effects help him to concentrate. He feels that usually licensed music playlists, which are implemented into a video game, are appropriate to the scene and genre of video game:

> “Brutal Legend, where you drive round in the car and you’ve got rock music playing all the time, it fits perfectly because it feels like GTA, and that works”

Ultimately Adam H prefers not to use user-selected playlists but appreciates the implementation of licensed music playlists.

Alice discusses the implementation of licensed music playlists in video games, which have a positive effect on her video game enjoyment, even if the playlists repeat. She explains that repetition of VGM with regards to licensed music playlists do not have a negative impact on her video game enjoyment when they are appropriate to the scene and to the video game genre. She believes that the licensed playlists can become iconic and add identity to certain video games where players even expect those genres of video games to implement licensed music playlists, and gives an example of in-game diegetic radio stations:

> "Grand Theft Auto or Saints Row, people immediately think of the radio stations because that's just part of the thing, you steal the car and you change the stations"

She explains that repetition of VGM is not a problem in those video games that implement licensed music playlists because players tend not to be delayed in the scenes where the licensed music is heard, and do not become overfamiliar with the VGM. Also, because the licensed music playlists are implemented in such a way that they suspend the player's disbelief, she is more appreciative of their implementation.

Daniel believes that user-selected playlists can improve his engagement but he does not use them strategically to improve his performance. He explains that when he does use his own user-selected playlists he prefers to listen to genres that he wants to rather than using a playlist that repeats. However, he prefers to have the user-selected playlists in the background which helps him engage with the video game rather than mute the VGM entirely when he does not like the video game's VGM. When he likes that VGM he will not use his own user-selected playlists.

Jimmy uses user-selected playlists strategically in video games and does repeat them for that purpose. He explains that he creates familiar and liked user-selected playlists to help him focus, engage, and improve his performance. He also uses these playlists in other video games to help him engage with those video games. Jimmy explains his experience with licensed music playlists and discusses when he is in a scene for prolonged periods due to player delay, he will choose music from a licensed music playlist that he prefers and likes to help him engage with a video game.

Max explains that he prefers not to use user-selected playlists because his own familiar and liked music can be intrusive, which distracts, disturbs, and disengages him, instead preferring to mute or tolerate the repeating VGM. He does customise and personalise licensed music playlists in racing games when

he likes specific songs or tracks, which then repeat. He prefers to listen to the VGM in video games that employ soundscape VGM, which loop in video games, rather than use user-selected playlists.

Midge explains that he does not use user-selected playlists in multiplayer games and tends to mute the VGM entirely. He discusses customisation and personalisation of licensed music playlists where he customises playlists by removing music that he dislikes, which creates a personalised licensed music playlist in a racing game. He explains that he will not purposely repeat liked music in that playlist but will not listen to music that is disliked:

> "Burnout Paradise, I think they had Rock music as they described it, and there was Avril Levine, and stuff, and that went straight off…if I listened to them and they were particularly unenjoyable I then just turned them off"

He also continues to discuss user-selected playlists in a single video game, which players invest large amounts of time into. He explains that in those open-world genres (video games that give the player agency to explore and complete the objectives of the game) he prefers not to use user-selected playlists because they have a negative impact on his immersion, presence, and his suspension of disbelief. He continues to discuss playlists with regards to single player games and player feedback, where he agrees that the use of user-selected playlists can diminish player feedback with regards to leitmotif. He believes that the use of user-selected playlists is video game genre dependent and explains that in some video games, which have simpler gameplay and do not utilise the entire screen, such as browser games, he prefers to use his own user-selected playlists. In other video games, such as turn-based strategy games, he also prefers his own liked and familiar user-selected playlists. He explains that he does not require the feedback from the repeating leitmotifs because of the turn-based gameplay of that genre of video game. However, in most single player games he will not use his own user-selected playlists because of the functional role of providing player feedback the repeating leitmotifs will offer him.

Tom A does use user-selected playlists when he becomes overfamiliar with the repeating VGM. He explains that due to overuse and a limited amount of VGM implemented in a video game he will substitute the VGM for his own user-selected playlist, or completely stop engaging with the video game. He usually uses user-selected playlists in multiplayer games because of the amount of time he spends in those genres. He also discusses the customisation, and personalisation, of licensed music playlists where he explains that he will customise, and personalise, licensed music playlists with music that he likes and becomes familiar with. He says that when he becomes familiar with the licensed music playlist he will not play disliked music and listen to music which is liked repeatedly. By doing this he can continue to enjoy the video game.

Tom P discusses that engagement is a subjective experience and that developers need to create VGM that can be liked or appreciated by many different players, otherwise players will employ user-selected playlists, which is what he does. He explains that his use of user-selected playlists can sometimes be to increase his performance in a video game, but only for certain genres of video games. He discusses that when he uses user-selected playlists they are usually random playlists. However, when he wants to increase his performance or needs to focus in a certain video games, such as a FPS, he will use familiar user-selected playlists strategically, which motivate him, increase his flow, and help him engage with that video game:

> "I used to play on the Call of Duty franchise, the zombie maps, I used to listen to certain, when you got to a high wave and you were the last man standing you'd listen to certain songs…a good one that I always used to like to do, the Last of Mohican soundtrack cos it's got a tempo build in it, so it makes you, well I used to like it cos it made me play a bit better"

He does not tend to customise and personalise licensed music playlists in racing games because he does not focus on the VGM, and prefers that the licensed music remain in the background:

> "the only one I've played properly is Wipeout Fusion, I'm more involved in trying to focus on the gameplay than I am the sounds so I tune the sound out into the background"

However, in other genres of video games which are more action orientated, such as a third-person shooter game, he customises and personalises licensed music playlists strategically to help him focus and improve his performance:

> "Warframe again, where it's a game where you have to focus, where you're having to do different actions and stuff, as opposed to just staying on a track and not crashing, then you'd change the music to help you focus"

Tom W prefers not to use user-selected playlists when he is engaging with video games because he enjoys listening to the VGM. He explains that when he likes and is familiar with a video game he enjoys listening to the VGM. He enjoys listening to low complexity VGM, which is sometimes hidden inside the video game, especially when he cannot listen to the VGM in a more traditional linear situation.

Vlad uses his own user-selected playlists when he engages with multiplayer games, and he explains that he does repeat certain playlists where he uses his familiarity for liked music strategically to improve his performance. He believes that music, which has more intensity, can help him focus and improve his performance in multiplayer games, and will repeat playlists to keep himself engaged, and focused.

Music Preference Tools

Even though Daniel has not experienced music preference tools he likes the concept of them. He explains that he would like to see the implementation of such systems in both single player and multiplayer games, and can see its use more for multiplayer games. He suggests that developers can implement a system as an alternative to the VGM created for a video game but not as a replacement, where it could be useful when the player does not like the video game's VGM. In multiplayer games he explains that this kind of system can create unique engagement. He discusses a combat scene where the music from a playlist can be appropriate to the type of character he is playing with, such as slower tempo music that can be used to signify a more powerful type of character and faster tempo music could signify a more agile character. He explains that because he uses VGM to help him focus and engage with video games he prefers the VGM to be scene appropriate, and a music preference tool system could create a highly personalised experience for him.

Jimmy believes that music preference tools can work as long as they can match music appropriately to the scene. He appreciates the implementation of music preference tools but feels that there is an issue with the playlists having categories that are appropriate to the scene. If the playlists are appropriate then he believes that the system can be useful, unique, and could reduce repetition. Later on in the interview he explains his concern about music preference tools. He believes that this type of system could hinder the functionality the repeating VGM provides in terms of acting as a form of player feedback, which the player expects. He explains that music preference tools can change this functional role but he also believes that these systems could be trialled. It is something that interests him, but he is also cautious.

Midge has no experience of music preference tools and explains that it is a system that he probably would not use. He thinks that repeating leitmotifs are more useful to his engagement. He believes that the implementation of music preference tools would diminish this functional role that the repeating leitmotif has. He explains that the implementation of music preference tools where he will hear only parts of his own music would be confusing and would irritate, annoy, frustrate, and disengage him with the video game. He can appreciate the concept and understands that some players may like that it reduces repetition but would prefer to have the functional role that a repeating leitmotif has with regards to feedback:

> "Gears of War, the music in the game lets you know what's happening, so if you swap that music out for your own made up list then it's a lot more difficult to differentiate between the tracks, like: 'Oh, is this a combat one, is this a car one?'"

He accepts that some genres of video games that have long scenes, or there is player delay in the scene, music preference tools could be a better approach because players will get to hear a piece of their own music in its entirety, but he still prefers a video game's VGM because it adds to the aesthetic of that video game. He does appreciate that players can get bored with overfamiliar VGM in multiplayer games where they do not always need VGM feedback because they are familiar with the gameplay due to the amount of time they have invested, and in those instances he can understand that some players may like to employ music preference tools. However, he is not one of those players.

Tom A appreciates the concept of music preference tools especially because he plays genres of video games that implement licensed playlists, which can quickly become overfamiliar for him. He explains that because he is familiar and likes his own music, the system can help him focus with those genres of video games and motivate him to engage with them:

> "say FIFA, for example, they might have a selection of twenty songs, so if I'm playing that three or four hours at a time those twenty songs…I'll go through them within an hour. So if it means I can listen to my songs…I'm gonna enjoy it more and I'll be more tolerable of the music, my music, because it's the music I like listening to"

He feels that a music preference tool system can be used in single player and multiplayer games, and believes that the system does not diminish the functional role that repeating VGM has when it provides the player with feedback. He understands this role and function in certain genres of video game but in video game genres that he prefers playing, such as sports games, he prefers to listen to his own liked and familiar music.

Tom P does not have any experience of music preference tools and explains that music preference tool systems could be implemented for multiplayer games, and mobile video games, but not for single player games. He believes that such a system would diminish his immersion and presence in single player games because repeating scene appropriate leitmotifs, which provide him with feedback, would not be present. He believes that these leitmotifs would be hindered by the implementation of music preference tools even if the player's own music conveys certain moods. Ultimately he believes that his immersion, and video game enjoyment, would be diminished by music preference tools because he is suspicious of their functionality and their ability to match his own music appropriately to the scene, but would like to see them trialled in a video game.

Tom W explains that he will not use user-selected playlists when he is engaged with video games because his own music distracts him, however, he does like the concept of music preference tools. He believes that music preference tools would be more suited for single player games because the audio,

specifically the sound effects, in multiplayer games tend to provide him with important feedback and he can be communicating with other players. He does explain that if he did utilise user-selected playlists then music preference tools would be something that increases his video game enjoyment due to their flexibility.

Procedural Audio

Daniel has no experience with procedural audio but can appreciate its implementation. However, he believes that the implementation of a procedural audio system would remove the familiarity he has with a leitmotif when he revisits a setting, which would have a negative effect on his video game enjoyment. He also believes that iconic themes, which add identity to a video game due to player familiarity with those themes, could be lost.

Max also has no experience of procedural audio but he likes the concept of it because it removes repetition of VGM. He believes that the concept of procedural audio is interesting but he feels that certain iconic themes that add identity to a video game would be removed. He explains that procedural audio could work better in certain genres of video games but not in others that use VGM in functional roles where familiarity with the VGM would be lost.

Tom P believes that procedural audio would work better for certain genres of video games and not others. He is not sure if he has experienced procedural audio before in video games but appreciates its implementation in certain genres of video game, such as horror games. He explains that the player can become familiar with repeating VGM in horror games, which acts as a form of feedback to them, and that can give the player a hint or clue as to what will happen next. He believes that in those situations procedural audio systems are a better approach and technique because the player cannot become familiar with the VGM created by that system, which increases tension for the player. However, in other genres of video games, such as action games, he believes that the implementation of procedural audio could diminish the feedback provided by familiar VGM, which can aid and guide the player:

> "Fallout, where it's just constantly changing randomly for no apparent reason, it'd cause you to be a bit confused, if nothing else, because you couldn't build connection bridges to the events happening in-game to the sounds"

He explains that some abstract video games, such as shoot 'em up games (SHMUP or STG), could benefit from procedural audio because of the gameplay involved with those genres of video games. But he believes that other video game genres, such FPS games, procedural audio could confuse players

because repeating VGM, which becomes familiar to players, would not be implemented and would not provide player feedback.

Tom W appreciates the approach and technique of procedural audio systems but acknowledges that these systems can diminish the communication of meaning that a repeating, and familiar, leitmotif can offer the player with regards to player feedback. He discusses that if procedural audio systems are implemented, they would need to be systems which maintain a familiar leitmotif that the player can recognise and use as feedback.

Vlad has some experience with procedural audio and understands how such a system can be implemented into a video game. He believes that procedural audio is an important approach and technique, which can be implemented into certain genres of video game where overfamiliarity with repeated VGM can be a problem. He explains that open-world video games, which provide the player with agency, can benefit from procedural systems but only if their implementation is seamless. He discusses a system that he has experience of and explains that in other genres of video game, which are more linear, procedural audio is not implemented but can be a design choice by the developers. He believes that in more linear video games, the developers prefer to have more control over the VGM:

> "Brothers, and such, well in that game people, it's a directed game, you have control over what you're doing, so if you would have the choice, if every designer or artist would have a choice, they would want to direct everything, they would not let algorithms do it"

Single Player and Multiplayer

Adam H explains that sometimes when he is communicating with other players in a multiplayer game he will turn off the VGM completely. He says that even if he does not communicate with other players he tends to mute the VGM when he is engaging with multiplayer games. This is not because of VGM repetition and overfamiliarity because when he is engaging with the same video game example in single player he continues to have the VGM turned on, and he does not mute the repeating VGM in other single player games:

> "League of Legends, I know it's a multiplayer game, but if I play it by myself I will have music on, if I play with somebody else I don't have music on, even if I don't talk to them or type to them, then I won't put music on"

Alice explains that due to the time she invests into the repetitive gameplay of multiplayer games she becomes overfamiliar with the repeating VGM, and employs her own user-selected playlists. She says that this is not because the VGM is disliked but she suffers listener fatigue and satiation where she

can become indifferent to the VGM. Alice explains that she employs user-selected playlists into a single-player video game, which she has invested a lot of time into, because she is overfamiliar with the VGM, even if it is liked:

> "I play a lot of Warcraft and that is the first thing that I shut off. Like, that music's got to go. And it's not because it's bad music, it's just when you've heard it for a thousand hours you don't want to hear it anymore. So, you put something else on, you either put on your own music, or a show, or whatever you're doing depending on your attention level"

She explains that when she uses her own user-selected playlists she can customise and personalise her engagement with multiplayer games, which can increase her video game enjoyment:

> "Fallout as an example in single player, but I do tend to use mods to load music into it because there's, it's nice, I love it"

However, she prefers to keep the VGM in other single player games because she believes that VGM is appropriate to the scene and the genre of video game, the VGM is in the background, or that she is indifferent to the VGM:

> "Halo, where that's not as appropriate because there's a lot going on and I either don't care about the music or I'm not paying attention to it, or it's nice and appropriate to what's going on"

Daniel discusses that the way he listens to the VGM in multiplayer games is different compared to single player games with regards to using user-selected playlists. He explains that he does replace liked VGM with his own user-selected playlists due to repetition of VGM for multiplayer games that he invests a lot of time into, however, this is not due to overfamiliarity. He explains that he uses his own music to help him focus and believes that the original VGM is not that important in multiplayer games, preferring his own user-selected playlists. He also believes that players employ user-selected playlists because he thinks players are indifferent to the VGM in competitive multiplayer games. In these video games Daniel believes that players are concentrating on different aspects of the video game and the VGM has a diminished role.

Jimmy believes that the way players engage with multiplayer games is different compared to single player games, which means that they can turn off the VGM completely, and this is not necessarily because of the repetition of VGM. He explains that even though some single player games, such as a RPG, which the player can invest a lot of time into, the kind of engagement is different for multiplayer games that players also invest a lot of time into. He believes that because multiplayer games can incorporate teamwork he can spend excessive amounts of time in a scene with a team, and that can

lead to VGM repetition due to player delay. In those situations he can choose to incorporate his own playlists or licensed music playlists that have been implemented into the video game:

> "World of Warcraft or Runescape, you'll probably spend five, ten hours, or twenty, or more than a few hundred hours, but you'll be doing things in the group…[y]ou might put your own playlists, you might switch off the music and listen to something else, or whatever jukebox the developer gives you"

Max normally prefers to leave the VGM on in video games, even if it repeats, especially in single player games. When he is engaged with a single player game he likes and appreciates the VGM of, he will sometimes reduce the volume so he can hear the rest of the audio. With regards to multiplayer games, Max will reduce the volume or mute the VGM sometimes when he is communicating with other players. Max explains that he does not mute the VGM in multiplayer games because of overfamiliarity, listener fatigue, or satiation with the VGM due to repetition. He also believes that the implementation of repeating VGM can be different because developers understand the differences between single player and multiplayer games. Max agrees that in some competitive multiplayer games developers purposely use the approach and technique of keeping the VGM in the background, which reduces repetition.

Midge discusses that VGM in multiplayer games can be intrusive because he is communicating with other players and does not require repeating VGM, which provides him with feedback, because other players can do that. Midge explains that he does not mute the VGM due to overfamiliarity in multiplayer games but because silence helps him to focus, and that the VGM in multiplayer games can distract, disturb, and disengage him.

Tom P discusses that his irritation with VGM repetition is contextually dependant on the genre of video game. He considers multiplayer games that have VGM in the background to be more tolerable with regards to repetition because he views those video games as having different kinds of gameplay, where the VGM is not as important as it could be with single player games:

> "Left 4 Dead, for example, the background music is a supplement and it can be repeated to the point where you, cos you're not really focusing that much on it, you're more focusing on the sporadic gameplay and if a teammate decides they always want to run away"

He has the experience of playing single player and multiplayer games for many hours, and gets overfamiliar with the repeating VGM, which causes satiation and listener fatigue. When he is familiar with the gameplay of games that he has invested a lot of time into, he feels that he does not need the repeating VGM to provide him with feedback. In these situations he will employ his own user-selected

playlists to stop the repeated VGM becoming tedious, boring, irritating, annoying, disturbing, non-pleasurable, and disengaging, which leads to disliked VGM:

> "a PC game called Warframe I've played, once you get over a couple of hundred hours you get bored of the same sounds, so what I'll do is turn the game music down because you've got enough gameplay experience to understand the situations that are happening and react to them without an audio aid, so then I put my own music on so it breaks the monotony of them"

However, he generally prefers VGM in single player games to be the intended soundtrack the developers created for that video game. He explains that if he employs a user-selected playlist in a single player game, the communication of meaning would not be present from the repetition of VGM, which adds to his immersion and engagement:

> "Bioshock, where that's, the soundtrack…they're all really good at enhancing the immersion and the gameplay experience. So it feels like if you put your own audio over the top of that you are losing a bit of the gameplay"

He believes that engagement is different between single player and multiplayer games, and that he requires the VGM in a single player game more than in a multiplayer game.

Vlad explains that repetition of VGM on his video game enjoyment is dependent on whether he is playing a single player game or a multiplayer one. He discusses that his enjoyment of multiplayer games is impacted by VGM repetition, where he will turn off the VGM completely and replace it with user-selected playlists. He becomes satiated and suffers from listener fatigue due to becoming overfamiliar with the repeating VGM of multiplayer games because of the time he invests into those genres, even if he likes that VGM. In multiplayer games Vlad has no preference for music generally as long as he can hear the sound effects of a video game, which allow him to engage with it:

> "if I'm playing StarCraft right? The league? Or I'm playing a FPS, I don't really care what the music is as long as you can hear the sound effects of the mechanics, it doesn't really matter, right? So, for multiplayer I would just say music doesn't matter because I just turn it off"

When discussing single player games he is more tolerant of VGM repetition and explains that if he likes the VGM it can have a positive impact on his enjoyment of single player games.

Retro Video Games

Adam H is more tolerant of the looping and repetition of VGM in retro games, and video games created in that style, because of the technological constraints of the available hardware. He discusses the iconic aesthetic identity of retro games and their abstract nature, which features different gameplay

compared to modern video games. He admits that he likes catchy VGM with regards to retro games and that he enjoys engaging with that genre of video game, unless the video game annoys him. He explains that there is a degree of expectation and nostalgia attached to the looping of VGM in retro games. He believes that this nostalgia is rooted in the familiarity of playing what are now considered retro games from his childhood:

> "Dig Dug, and it feels massively nostalgic, so yeah I definitely, I feel it's probably one of the larger reasons why this stuff's done is that it's a sense of familiarity, trying to bring you back to your childhood or your youth when playing them"

Alice has a different perspective on looped VGM from retro games where she believes the repetition of VGM has a negative impact on her enjoyment. She is more tolerant of looped VGM in retro games when the VGM is liked and if it is catchy. However, she finds the looping of VGM in retro games irritating, annoying, non-pleasurable, intrusive, and tedious because of the low complexity of the looped VGM:

> "I think it gets old really fast cos the loop tends to be really short on those, and for me it just grates me. I can't do that, unless it's something nice that I like generally it is annoying. Like Mario music. I can't stand it"

She also has a negative opinion on the implementation of looped VGM created in the style of retro games, even if she appreciates why the developers chose that style. She prefers that VGM created for video games in the style of retro games should not be constricted by the same constraints that retro games had.

Daniel's enjoyment of retro games can be dependent on his nostalgia for that video game, but also whether he is sated with the video game. He explains that repetition of VGM with regards to his enjoyment of retro games, and video games created in that style, depends on where in the VGM he notices the looping. He mostly enjoys the looped VGM in retro games but the repetition can become overfamiliar for him. When he becomes bored of the looped VGM he replaces it with a user-selected playlist until he wants to listen to the looped VGM again.

Even if Jimmy enjoys the implementation of looped VGM in retro games, where repeated exposure increases his familiarity with the VGM, overfamiliarity can make him indifferent to the VGM. Although repetition does not disengage him from the video game, the VGM becomes boring, even if the VGM is catchy. He still believes that the VGM plays an important role in adding identity to the video game and that it can be iconic:

> "it just gives the game identity again. It tells you that this is what the game is, this is the sound it plays, Street Fighter, Pac-Man. You'll probably know how a theme goes to it"

However, the repetition of looped VGM in retro games does not have a negative impact on his enjoyment of those video games.

Max enjoys listening to Chiptune outside of his engagement with a video game. With regards to retro games, he believes that nostalgia plays an important role in his opinion of looping and repetition of VGM in those games. He explains that he never becomes sated with listening to the looping and repetition of VGM in retro games.

Midge appreciates the implementation of repetition in retro games and attaches some nostalgia to them. He explains that in a retro game the looped VGM would increase in tempo when a timer was running out, which provided him with feedback and increased his video game enjoyment (although this actually did not happen in the example he gave, it was not uncommon to implement such a function in retro games):

> "Sonic, for instance, your Green Hill Zone, first area, everyone remembers the track for that and that was a nice bit of music that you heard over, every time you started the game, you had to hear that track, and that was fine because you were also timed on that so as your timer went down as you got near the end it sped up, and that was really good"

In a modern video game which is created in the style of a retro game, he explains that the VGM was more in the background and was not the focus for him when he was engaged with the video game. However, he remembers that he liked the VGM and that it felt appropriate to the genre of the video game, and was implemented in a functional role:

> "Expendabros or Broforce, kinda thing, and that isn't timed, the music in that isn't really, I didn't really pay much attention to it to be honest, I was too busy murdering people with Bronan the Barbarian. I enjoyed it looking back at it, the music, because of how it worked"

Tom A tolerates the implementation of looped VGM in retro games, and video games created in that style, more than in modern video games. He explains that the looping and repetition of VGM in retro games increases his familiarity with the VGM where that VGM becomes part of the background for him. He is more appreciative, and tolerant, of looping and repetition of VGM in retro games because of the technological constraints of the then current technology:

> "Pac-Man, for example, I suppose the more you play it the more you get used to the music. So you, unless you are really focusing on that music it just becomes part of the environment.

> So I would say the more classic games, I can tolerate more of the repetitive music because, obviously, back then there was less music to be used"

He is less tolerant of the looping and repetition of VGM in modern video games. However, when it comes to video games created in the style of retro games he is more accepting of the looping and repetition of VGM. He expects the VGM to be appropriate to the genre of video game, so for video games created in the style of retro games he expects the VGM to be looped and for modern video games he expects the VGM not to be looped, and to be higher complexity.

Tom P discusses that familiarity, nostalgia for retro games, and their use of appropriate VGM is important. He explains that retro games which used looped VGM are iconic and that the looped VGM added to the identity, and aesthetic, of those video games:

> "Pokémon, the old Pokémons, they use 8-bit soundtracks and they're well known enough that it's a household name for the majority of people that have grown-up in the last 15 to 20 years"

He explains that the technological constraints of the memory available meant that developers would implement looped VGM (the example mentioned was actually 32KB in size and not 12MB, which he believed it to be). In retro games he believes that the VGM did not play an important role and was implemented to enhance the video game, but was not necessary:

> "Super Mario and stuff, the original game was something like 12 Mega-Bytes, or something, so they only had 12 Mega-Bytes for an entire game. In those type of examples, again, the music is a supplement but not a necessity cos you're more, they're there to enhance gameplay, but it could be done without them"

However, in an example of a retro game where the VGM is looped, he believes that if the player does notice the repetition it can focus the player:

> "Pokémon, like a good old example, a good old retro game now, the old versions, a lot of the music they used were looped but you didn't mind it cos your focus was on the gameplay, it's just the audio aided that"

When discussing the use of looped VGM into retro styled video games, he explains that there is some expectation for retro styled video games to use looped VGM as it is appropriate to that genre. However, he believes that retro styled video games that are more complex and offer greater depth than abstract video games can have higher complexity VGM:

> "Hyper Light Drifter, I think that has a pretty unique soundtrack to it, if I my memory serves, so that's an example where it breaks the mould but I think it does it in a good way"

Future

Daniel believes that repetition of VGM will continue to be a part of video games in the future. He would like to see the implementation of an alternative system but not as a complete replacement because he enjoys listening to liked iconic themes in video games, which provide him with feedback.

Jimmy discusses his views and perspectives on the future of repetition of VGM with regards to its role and function, and whether it will disappear completely in the future. He does not think that repetition of VGM will change in the future until systems that reduce, conceal, and remove VGM repetition are tried, and tested more. He believes that even if these systems were more widely implemented, repetition of VGM would still be a part of video gaming. He believes that VGM repetition, specifically loops, are an important part of the aesthetic of video games with regards to their history, present, and future. However, he does think that when technology improves in the future, there could be a possibility that looping will be superseded.

Max discusses his views on the future role and function of VGM repetition, and whether it is a problem that needs a solution. He believes that systems that reduce, conceal, and remove repetition of VGM such as music preference tools can be the future of VGM repetition. However, he does not think that repetition of VGM and the current implementation of repeating VGM is a major problem. Even in these situations he does understand and appreciates the implementation of repeating leitmotifs because they have a functional role.

Midge discusses his opinion on the future of VGM repetition with regards to it role and function, and whether it will improve. He believes that repetition of music can be a positive approach and technique in film, and gives an example of a leitmotif which is repeated using a variation to communicate a different meaning at a different part of the film:

> "I know it's not game related but Team America, that theme song (sings): 'America, **** yeah!', when there's a sad moment, and it's on the background, it's slowed down (sings): 'America', and that's a really good use, and that's the same, it's the same track but it's portraying two different things"

He explains that while the leitmotif is a variation, it remains familiar and can see a similar, functional, use for the repetition of VGM in video games. He believes this functional role will continue into the future of video games because familiarity with a repeating leitmotif, or variations of a leitmotif, provides the player with feedback, which is important to player engagement.

Tom A explains his perspective on the future role and function of VGM repetition with regards to single player, and multiplayer games. He believes that the repetition of VGM in the future will be more

appropriate for single player games. He explains that single player games, which have more linear engagement and narrative, benefit from the feedback provided by repeating leitmotifs, and gives an example of a FPS game where a scene appropriate repeating leitmotif provides player feedback:

> "more linear stories, so say as a campaign for a game, I think it'll be more used for that. So if I'm doing, so obviously games like Doom, for example, bringing it back to when tracks in the tempo picked up"

However, he does not think that multiplayer games will utilise repetition of VGM because he believes that the gameplay in those genres of video game is different to single player games. Ultimately he believes that single player games of the future, which have more linearity and have less player agency, are more suited to VGM repetition.

Tom P believes that repetition of VGM has a role and function in the future of video games from industry, consumer, and technical perspectives. He appreciates that repetition of VGM will continue into the future of video games. He explains that the cost of creating VGM is taken up by the consumer and believes that the implementation of VGM repetition reduces this cost. He also believes that the repetition of VGM is a valid approach and technique that has worked in the past, works in the present, and will continue to work in the future. He has the perspective that VGM repetition is not a problem and will continue to be improved upon.

Tom W discusses the future role and function of VGM repetition, whether it is a problem that requires a solution, and what approaches and techniques can be employed to reduce, conceal, and remove repetition of VGM in the future. He does not view the repetition of VGM to be a major problem with video games and even appreciates its implementation. He does not think the repetition of VGM should and will change drastically in the future. He believes that current approaches and techniques in VGM creation, and implementation, are sufficient.

DISCUSSION

Looping and Repetition

Enjoyment, Repetition, and Interactivity

Participants of this study have the general perception that VGM repetition with regards to video game enjoyment is contextually dependent on whether its implementation improves engagement. Participants can find the repetition of VGM to be a negative phenomenon, however, most participants can appreciate and tolerate the repetition of VGM, and understand that VGM repetition can have a positive impact on their video game enjoyment. Participants understand that VGM is listened to differently in video games because of interactivity. The time and effort required, time constraints, and financial constraints can make it difficult to produce unique music for all the different scenes in a video game. This understanding can make some participants more tolerant to VGM repetition. One participant acknowledges that they listen to VGM differently compared to linear listening contexts because they will continue to listen to disliked VGM when it repeats in a scene. One participant explains that diegetic music in a FPS game is listened to differently because he has player agency to select what VGM is listened to. One participant even goes even further and believes that developers do not realise the potential of VGM repetition in video games.

Familiarity, Liking, Complexity, and Overfamiliarity

Participants confirm the relationship where repeated exposure to VGM increases their familiarity of the VGM and that familiarity increases their liking of the VGM, even when they may have initially disliked or felt indifferent to the VGM. Familiarity with VGM can also increases participants' liking when they replay video games, with some participants replaying certain video games just so they can appreciate liked VGM. This also applies to scenes in video games where participants will actively revisit scenes because they like the scene appropriate VGM. Also, when the scene appropriate VGM is liked some participants will purposely remain in the scene so that they can appreciate the liked scene appropriate VGM. Participants liking of familiar repeating VGM can help them to engage, and enjoy video games through hedonic pleasure, because participants find it easier to engage with video games when they are familiar with, and like, the repeating VGM. In this context the liked and familiar VGM can motivate players to engage with video games, it can immerse them more into the game world, it can improve their performance because the VGM is familiar and liked, and can also act as a form of gratification to players. Affective, cognitive, and behavioural enjoyment is also impacted by repeated exposure, familiarity, and liking. As participants become more familiar with repeating VGM their cognitive enjoyment of the video game increases as they begin to recognise the repeating VGM, their

liking of the familiar VGM increases, which can be understood as an increase in their affective enjoyment of the video game, finally their behaviour changes as the participants begin to appreciate the repeating VGM, which increases their behavioural video game enjoyment.

Initially liking the VGM can have a positive impact on the player's hedonic video game enjoyment when it repeats, while disliking the VGM can have a negative impact on the player's hedonic video game enjoyment when it repeats. Liking the VGM can mean that participants appreciate and tolerate the repetition of VGM more than if they disliked the VGM. Liking the repeating VGM can increase hedonic and affective video game enjoyment because participants feel pleasure when they hear liked repeating VGM. Liking of the actual video game also has an impact on whether VGM repetition is a positive or negative phenomenon for participants. Repetition of disliked VGM can annoy and distract participants, and can have a negative effect on their hedonic, and affective video game enjoyment. Some participants can tolerate disliked VGM when it repeats and become indifferent to the repetition as they become more familiar with the disliked VGM. This can have an impact on their affective and behavioural video game enjoyment because they begin to accept the disliked repeating VGM as they become familiar with it. Disliked and repeating VGM can be tolerated more if the video game is hedonistically enjoyable for participants. When disliked VGM is appropriate to the scene participants are more tolerant of the repetition because it is fulfilling a functional role of accompanying the scene. This functional role positively effects cognitive video game enjoyment, feedback, suspension of disbelief, immersion, motivation, and presence even if the repeating VGM is disliked. This is because participants believe that the role and function of scene appropriate VGM is more important than liking or disliking the VGM. However, if the disliked repeating VGM is not appropriate to the scene it can annoy participants. Disliked scene appropriate VGM can have a negative impact of the participants' hedonic, affective, and behavioural video game enjoyment when they are delayed in a scene, which can mean participants mute the VGM in order to improve their mood and performance. Certain pieces of disliked VGM, which are not appropriate to the video game genre, are tolerated when they repeat by participants. However, if the entire soundtrack of the video game is disliked and is not appropriate to the video game genre it can have a negative impact on the participants' hedonic video game enjoyment.

Participants confirm that repeated exposure to VGM increasing their familiarity with the repeating VGM which, in turn, diminishes their subjective perceived complexity with that VGM. Participants can prefer high complexity VGM over low complexity VGM when it repeats. Participants believe that as their subjective perceived complexity decreases with high complexity VGM their liking for that high complexity VGM increases due to familiarity. The participants' hedonic and eudaimonic video game enjoyment increases as the subjective perceived complexity decreases because participants begin to

understand the familiar high complexity VGM. Participants notice different aspects of high complexity VGM as they become more familiar with it. As the VGM subjective perceived complexity decreases participants' affective and cognitive video game enjoyment increases because they begin to appreciate the repeating high complexity VGM. Decreased subjective perceived complexity can increase the participants' immersion, presence, and motivation as they become more familiar with the high complexity VGM. In fact some participants believe that repetition of high complexity VGM may not be noticed by the player at all, even if it loops.

Scene appropriate VGM which initially is low complexity but becomes more complex when it is repeated through the player revisiting scenes also becomes more familiar to participants, which increases their liking of that VGM. In this context the participants' autonomy, control, and effectance are increased because they feel that their influence in the game world can be heard through the additional layers of the repeating VGM. Repetition of low complexity VGM can lead to overfamiliarity and listener fatigue for participants. Some participants tolerate low complexity VGM when it repeats because it is appropriate to the scene and video game genre, but are more aware of it repeating due to the low complexity of the VGM. Repetition of low complexity VGM can have an impact on participants' affective, cognitive, and behavioural video game enjoyment. There is an expectation from participants for modern video games to implement higher complexity VGM, but lower complexity VGM is tolerated in indie video games due to development costs and constraints, however, only if it is implemented to a high standard. Sometimes participants are not listening to the VGM, or VGM is listened to differently, in a video game because it is not the focus of their engagement. However, they do sometimes hear different aspects of the VGM every time it repeats due to the VGM's complexity.

Participants believe that familiarity with VGM can lead to overfamiliarity with the repeating VGM, which causes boredom, listener fatigue, and satiation, and has an effect on their hedonic video game enjoyment. Overfamiliarity with repeating VGM can also have an effect on the participants' hedonic video game enjoyment when the VGM is initially liked, and can lead participants to dislike the overfamiliar VGM. Some participants appreciate the repetition and appreciate becoming familiar with liked VGM when it repeats. As long as the repeating VGM does not become overfamiliar participants are appreciative and tolerant of repeating VGM when they like the VGM. However, if the repeating VGM is disliked overfamiliarity leads to the participants becoming annoyed with the repetition, and they feel sated more quickly. Unfortunately, participants' affective, cognitive, and behavioural video game enjoyment can decrease due to VGM overfamiliarity, it can have a negative impact on their motivation, immersion, and presence, it can interfere with their flow and performance, and it can break their suspension of disbelief. Overuse of a repeating scene appropriate leitmotif, which

communicates meaning to participants, has an effect on eudaimonic video game enjoyment. Participants can have an issue with overuse of a leitmotif if it is implemented inappropriately into a scene. In this context the overused scene appropriate leitmotif loses its meaning for participants and can disconnect them from the scene.

Player delay in a scene where scene appropriate VGM is looped can lead to overfamiliarity for participants. It can be intrusive, distracting, non-pleasurable, disconnecting, and be contradictory to the scene for participants. Overfamiliarity can occur when participants are replaying scenes where the VGM is appropriate to that scene. If participants are having to replay scenes due to player death and are frustrated with their engagement, then overfamiliarity with the VGM can cause listener fatigue and satiation. In these contexts overfamiliarity can disengage participants and has an impact on their hedonic, affective, cognitive, and behavioural video game enjoyment by breaking flow, where overfamiliarity can frustrate players and impact their performance, motivation, immersion, and presence. It can also impact participants' competence, control, effectance, and self-efficiency because they do not feel they can change the situation until they complete and progress past the scene. However, this can be due to their frustration with the scene, their ability to engage with the video game, and not necessarily because of repetition.

Leitmotif and Theme

Participants appreciate the implementation of repeating leitmotifs in video games because they communicate meaning to the player. Repetition and familiarity in this context have a functional role for the participant, providing them with feedback. As repeating leitmotifs become familiar to the participants the leitmotifs provide feedback to them because participants learn the different meanings associated to different leitmotifs, and every time they hear the different leitmotifs they understand what they are communicating to them. This helps participants with the learning curve of the video game because it becomes another layer of feedback to them. The use of a leitmotif as a form of feedback can be especially important for participants when they do not have a visual form of feedback and where the player has a lot of agency in a video game.

Familiarity with repeating leitmotifs which communicate meaning, and provide the player with feedback, aid and guide participants. This can be important to participants when a leitmotif is appropriate to the scene, such as combat, essentially providing them with feedback and warning them of attacking enemies. Participants appreciate the functional role that a leitmotif has when they begin or complete an aim and goal of a video game, such as initiating combat or killing enemies. This leitmotif is heard every time the aim and goal is begun or completed, and participants use this familiar leitmotif as feedback, communicating to them that they have begun or completed that particular aim and goal,

such as warning the player of attacking enemies, or communicating that the scene has been cleared of enemies and that the player is safe. Participants appreciate repeating leitmotifs when they help them focus in a scene of a video game. When participants are familiar with certain leitmotifs which provide them with feedback, such as warning the player of approaching combat, participants recognise the leitmotif and realise that the scene they are about to engage with requires their concentration.

Participants appreciate the implementation of a repeating leitmotif, which identifies characters, where every time they encounter a specific character in a video game they hear the associated leitmotif. This provides participants with feedback every time they hear the familiar leitmotif associated with that character. This can be particularly important to participants in video games which have a lot of player agency, such as when a familiar leitmotif is heard fading in every time their player character approaches an important NPC who provides the participant with aims and goals. In this context the leitmotif can aid and guide the participants. This also applies to identifying settings in a video game where participants appreciate the implementation of a repeating leitmotif, which identifies settings in a video game. When players visit settings they hear the leitmotif associated to that setting and every time they revisit that setting they hear the same leitmotif associated to that setting. When participants are familiar with the leitmotif they use it as a form of feedback informing them that they are approaching or are in that setting again. When participants revisit settings and hear the leitmotif associated with those settings they feel a sense of familiarity. Participants sometimes incorrectly used the term nostalgia to discuss their familiarity with the VGM but nostalgia is understood as being a sentimental longing for the past, a period in the past, or a thing in the past. In this, and similar cases, participants are discussing their memories with the video game, and the VGM, and a more appropriate term is used in these situations. Some participants find the functional role of leitmotif especially important when there is no map in the video game they are engaging with and they have a lot of player agency. In this context, a leitmotif, which identifies settings, provides participants with audio feedback about where they are situated in the video game.

Participants appreciate the implementation of a repeating leitmotif, which identifies narrative in a video game. The leitmotif is heard every time the player encounters that part of the narrative and participants become familiar with that leitmotif associated with the narrative. Again, the repetition of a leitmotif provides them with feedback. Participants appreciate the implementation of a repeating leitmotif, which identifies moods, such as danger or combat. In this context the participants become familiar with the repeating leitmotif and the meaning communicated by it, warning the participant of danger or attack. Every time the participants hear the leitmotif it provides them with feedback because they can recognise that they are in danger or there are enemies around. Participants believe

that the implementation of the leitmotif technique in this context has a functional role in video games, which increases their video game enjoyment, improves their engagement, and they are more tolerant of the repetition.

Apart from increasing the participants' enjoyment due to providing them with player feedback, familiar leitmotifs can increase video game enjoyment for participants in several ways. They can increase their hedonic enjoyment of the video game because the feedback provided by familiar leitmotifs can become another layer of their engagement. It can increase their eudaimonic enjoyment because the familiar leitmotifs can communicate meaning to players, especially a leitmotif which identifies characters, settings, narrative, and mood. Player feedback provided by a familiar repeating leitmotif can gratify participants because it can provide participants with pleasurable and moving content. It can increase their affective, cognitive, and behavioural enjoyment because the meaning communicated through familiar leitmotifs can be emotional, it can change players' judgements of game elements, and it can positively impact their behaviour in certain scenes. As participants become familiar with leitmotifs that provide them with feedback, the repeating leitmotifs can motivate them. Due to the leitmotifs being scene appropriate the participants will hear appropriate leitmotifs when they enter, and re-enter different scenes, which gives players a sense of autonomy.

Sometimes a familiar repeating leitmotif will be heard when players complete an objective in a video game, which can give players a sense of competence. Autonomy and competence are two basic needs that are satisfied with regards to SDT and can increase video game enjoyment. Flow can be improved by familiarity with a leitmotif, which communicates meaning, due to its functional role of providing player feedback, and this can improve player performance in challenging scenes, which increases video game enjoyment. The feelings of control, player agency, and self-efficiency are increased when participants are familiar with a repeating leitmotif, which is scene appropriate, because the leitmotif provides them with feedback about the scene. A repeating familiar leitmotif can also give participants a sense of effectance in a video game because players can feel that they are influencing a video game by listening to changes in the leitmotif.

Participants can feel more immersed in a video game when a familiar leitmotif has a functional role of providing player feedback as it becomes an additional layer of their engagement. Familiar leitmotifs, which are appropriate to the scene and communicate meaning to the player, can increase the participants' presence in a scene. Communication of meaning by familiar leitmotifs can also have a positive impact on the participants' transportation into a video game, especially familiar leitmotifs which identify characters, settings, narrative, and mood, which can also suspend their disbelief. Familiar leitmotifs which identify characters and narrative can help participants identify with the hero,

and improve their affective disposition about characters. Familiarity with a repeating leitmotif, which communicates meaning, can also be a form of foreshadowing in a video game for participants. Due to participants being familiar with scene appropriate leitmotifs they can recognise scene changes when the scene appropriate leitmotifs change, which increases their suspense.

Looping a leitmotif is also appreciated by participants because it provides feedback to the player. Changes in the tempo of a looped leitmotif communicates meaning to the player by identifying changes in the mood of the video game, warning the player that a timer is running out or that the player's health is low. This increases the participants' affective, cognitive, and behavioural enjoyment of the video game as they realise they are in danger, it can motivate them to perform better, it can help them with flow because they realise that they have to improve their skill as the challenge increases, and it can increase their suspense because they can doubt that the outcome will be successful.

Participants appreciate the implementation of a repeating and familiar leitmotif when it is used to provide feedback in similar scenes as they progress through a video game, where the leitmotif acts as a form of continuity. Participants are also appreciative of a familiar leitmotif when it is used similarly in different iterations of a video game across a franchise, where the leitmotif acts as a form of unity, such as when it identifies the player levelling up. However, the familiar leitmotif can communicate different meanings to the participants when they are in the same setting in different iterations of a video game franchise.

Liked leitmotifs can improve their hedonic and eudaimonic video game enjoyment. However, disliked repeating leitmotifs can have a negative impact on the participants' hedonic video game enjoyment. Even if the repeating leitmotif is disliked, participants are still appreciative of its role and function when it provides player feedback. Some participants prefer a high complexity repeating leitmotif because it does not become overfamiliar leading to listener fatigue. Some participants are more tolerant of a leitmotif's repetition because the leitmotif is only heard at specific moments in the video game, which means it repeats less compared to looped VGM. Some participants believe that the implementation of a leitmotif that provides the player with feedback can increase cognitive video game enjoyment because the information provided is sufficient and does not give them excessive amounts of information.

Participants agree that iconic themes, or variations of them, can be a good approach and technique implemented to add a sense of continuity, and unity, as they progress through a video game. However, some participants explained that they are sometimes indifferent to the repetition of familiar iconic themes, which act as a form of continuity in a video game and give a sense of unity across video game

franchises. The implementation of repeated iconic themes, which are scene appropriate and become familiar to the participants, can provide them with feedback. When repetition is used in this context the participants believe their video game enjoyment increases. Repetition of iconic themes can also impact participants' hedonic video game enjoyment, where liking of an iconic theme can make repetition of it pleasurable.

Some participants believe that the use of repeating iconic themes that add a sense of continuity for the player can depend on the VGM's creation and implementation. Some participants appreciate and tolerate the implementation of a repeating iconic theme when it is scene appropriate, which they believe adds to the continuity of the video game. However, repetition of iconic themes which are not appropriate to the scene have a negative impact on the participants' hedonic video game enjoyment, immersion and presence, suspension of disbelief, and can be contradictory to the scene. The inappropriate iconic themes can have a negative impact on the participants' affective, cognitive, and behavioural video game enjoyment because they believe that the VGM does not fit. Participants believe that the repeating iconic theme should be fulfilling its functional role which is to act as a form of continuity. One participant believes that iconic themes, or a variation of that theme, motivates them and helps them identify with the hero. The repetition of that iconic theme empowers the participant, it aids and guides them, and helps them to focus. One participant appreciates the implementation of a repeating and familiar iconic theme, which provides them with the exact same feedback throughout their progression in a video game. This consistency gives the participant as sense of continuity as they progress through the video game. However, if the theme is overused they can become sated and this has an effect on their hedonic, and eudaimonic, video game enjoyment because the theme can lose its meaning. One participant is less tolerant of iconic theme repetition when the genre of VGM is disliked, boring, and tedious. One participant only notices the familiar iconic themes when they are engaged in a scene which has little or low intensity gameplay.

Participants appreciate the implementation of familiar iconic themes, which are repeated across different iterations of a video game franchise, and expect those different iterations of the video game franchise to implement the familiar iconic themes or variations of them. This use of repetition has a positive impact on participants' affective, cognitive, and behavioural video game enjoyment because repetition of iconic themes gives participants a sense of unity across a video game franchise. Sometimes the implementation of themes across video game franchises can mean that the themes become iconic for participants. Some participants appreciate the implementation of iconic themes across iterations of a video game franchise because familiarity with the iconic themes helps them remember previous iterations they have played. Some participants prefer the implementation of variations with regards to repeating iconic themes, which add a sense of unity across video game

franchises. Participants can get bored with the VGM if the same iconic theme is overused in different iterations of a video game franchise.

However, if the same iconic theme is reused as an Easter egg in an iteration of a video game franchise the participants are more appreciative of its implementation. However, one participant disagrees and comments that Easter eggs in video games can have a negative impact on players' hedonic video game enjoyment if the iconic theme is disliked. The variations should remain familiar to the participants and communicate similar meanings in the different iterations of a video game. However, one participant explained that familiar variations of iconic themes can communicate a different meaning in different iterations of a video game franchise. One participant appreciates it when familiar iconic themes can be implemented in different iterations of a video game, where the themes are used to provide feedback in exactly the same way for appropriate scenes in all the different iterations of that video game franchise. One participant appreciates the implementation of a repeating iconic theme across different iterations of a video game franchise only when they enjoy the iteration of the video game they are engaged with.

Participants also appreciate the implementation of iconic themes, or their variations, in video games and across a video game franchise because it gives those video games their identity. Through repeated exposure, the participants can become familiar with the iconic themes and recognise the video game they are associated with just by the theme music. This can increase brand awareness for the participants with the video game or the video game franchise, and can increase sales. Participants believe that repetition of iconic themes, which add identity to video games and their franchises, increase their video game hedonic enjoyment. Participants' affective, cognitive, and behavioural enjoyment increase because they associate the iconic themes with the video game, and its franchise, they can be motivated to engage with the video game and its franchise because of this association, they can feel a sense of relatedness because the iconic themes connect them to other players, and can feel gratification when they engage with a video game where they expect the familiar iconic theme to be present. Some participants believe that the repeating iconic theme genre should be consistent throughout the video game, and be appropriate to the genre of the video game franchise. However, one participant cognitively enjoys it when a different genre of iconic theme is implemented into specific scenes that reoccur as they progresses through a video game, which help them identify with the hero.

Scene and Genre Appropriateness

Participants believe that repetition of VGM, and their video game enjoyment, is dependent on its implementation into an appropriate scene and genre of video game, explaining that their hedonic,

affective, cognitive, and behavioural video game enjoyment increases when VGM repetition is appropriate. Appropriateness can also increase the participants' immersion and presence into the game world, it can suspend their disbelief, and it can motivate them.

Participants are appreciative and tolerant of scene appropriate VGM when it repeats because they believe that repeating scene appropriate VGM has a functional role to provide the player with feedback. Scene appropriate leitmotif, which repeats when participants revisit scenes, can act as a form of recognition for them. Some participants prefer variations of scene appropriate leitmotifs when they revisit scenes as long as the variations of the leitmotifs are still familiar. In certain situations the variations of scene appropriate leitmotifs can communicate additional meaning to participants every time they re-enter the scene. Some participants believe that scene appropriate VGM which repeats is more important in certain genres of video games, such as action games or a FPS. In these genres of video game, participants believe that the scene appropriate VGM should match the intensity of the gameplay. The participants' believe that the scene appropriate VGM provides feedback about the scene's intensity, which can help participants with their self-efficiency. Scene appropriate VGM which repeats can be especially important when it fits the context of the scene, which can help participants identify with the hero and can add to the realism of the video game.

Generally participants prefer video game genre appropriate VGM and are more accepting and tolerant of the repetition of VGM when it is appropriate to the video game genre. One participant prefers the video game genre appropriate VGM to remain a consistent genre of music throughout a video game. One participant believes that when the VGM is video game genre appropriate, the repetition of that VGM remains in the background for them. One participant believes that the repetition of VGM should be appropriate to the video game genre, where the video game genre dictates the amount of repetition to be implemented. The participant believes that simpler or abstract video games, such as mobile games, which have less complex gameplay or shorter gameplay, means players engage with them for shorter periods of time and can implement looped VGM that is low complexity. The opposite is true for complex modern video games which players invest more time into, where the participant believes should have high complexity VGM which is not looped. One participant goes further and tolerates looped VGM in certain indie games because they believe that looped VGM is appropriate to that genre of video game. When the repeating VGM is not appropriate to the video game genre, the repetition can have a negative effect on participants' hedonic video game enjoyment because the inappropriate repeated VGM can disconnect and disengage players. Repetition of VGM, which is not appropriate to the video game genre, can have a negative impact on a participants' immersion, flow, and continuity. In this context participants believe that the repetition is contradictory to the video game and that the repetition becomes more obvious. Inappropriate VGM, which does not fit the video

game genre and is looped, can cause overfamiliarity for participants and lead to satiation, irritation, and annoyance. However, if purposely inappropriate VGM is intentionally implemented into a video game genre by a developer, participants can appreciate the inappropriate VGM, even when it repeats, and it can increase participants' hedonic video game enjoyment because they find the juxtaposition pleasurable. This can also apply when the repeating VGM is video game genre appropriate but the developer implements inappropriate repeating VGM for certain scenes.

Player Delay

Participants generally appreciate the implementation of a scene appropriate looped leitmotif, which provides player feedback about the scene, when they are delayed in that scene. Participants believe that their cognitive video game enjoyment increases because of the functional role the looped leitmotif has in providing player feedback where repetition can motivate them, immerse them into the scene, and their suspense increases because they are uncertain of their success. Looped leitmotifs implemented in this way can aid and guide participants, and focus them. One participant believes that the way looped scene appropriate VGM is implemented in this context can make a difference when they are delayed in a scene. The participant may feel patronised by the feedback the looped leitmotif is providing them as it is providing excessive information to the player. However, there are situations where the video game can malfunction (glitches) and the participants cannot complete the scene's aims and goals, and the scene appropriate leitmotif will continue to loop indefinitely. Participants view this as a negative impact on their hedonic video game enjoyment, the immersion and presence of the participants, and their affective, cognitive, and behavioural enjoyment because the video game is glitching. In this context the repetition can frustrate them, irritate them, and interfere with their suspension of disbelief. However, participants are tolerant if this happens and understand that this can be due to technological constraints, and bad implementation. Participants believe that timing cues, which fade the looped VGM into silence, are a possible solution to VGM repetition due to player delay.

Some participants believe that VGM complexity can also be important with regards to looped scene appropriate VGM and player delay. High complexity looped VGM is tolerated more by participants when they are delayed in a scene. Low complexity looped VGM can bore participants when they are delayed in a scene due to overfamiliarity, unless the participants like the looped scene appropriate VGM. The amount of time participants are delayed in a scene can also make a difference to their enjoyment of a video game. The longer participants spend delayed in a scene, the more repetition due to looping can have a negative effect on their hedonic video game enjoyment. One participant believes that sometimes, scene appropriate VGM which loops due to player delay is not a problem because

the VGM remains in the background. However, if the participant is sated with the scene they are delayed in, or they are sated with the scene appropriate VGM, repetition can have a negative effect on their hedonic video game enjoyment. Due to the participant experiencing less affective, cognitive, and behavioural enjoyment they will stop engaging with the video game.

When a scene appropriate leitmotif is implemented, via an adaptive/dynamic music system into a scene a participant is delayed in, small variations in the loop can be heard by the participant when small changes in the scene occur. This can aid, and guide, the participant and help them with the aims, and goals, of the scene. An example given is that of a looped scene appropriate leitmotif, which identifies mood, is constantly played as the player searches for clues in a scene. As the player moves closer to the clue, the looped leitmotif slightly changes, which communicates meaning to the player and provides feedback, notifying the player that they are getting closer to the clue. In this context the looped scene appropriate leitmotif becomes useful for the participant because it provides feedback, which increases flow, autonomy, and competence. Also, their affective, cognitive, and behavioural enjoyment increase because they are using the VGM for gameplay. Changes in the looped leitmotif motivates them, they feel that they have control, the participant has more presence and is more immersed, and their effectance is increased.

Approaches and Techniques

Adaptive/Dynamic Music

Participants appreciate the implementation of adaptive/dynamic music, with most preferring the system over constantly looped VGM because it reduces repetition and is more flexible. Participants believe that this type of system improves their video game affective, cognitive, and behavioural enjoyment. Adaptive/dynamic music is preferred and expected in most modern video games, such as action games and FPS games, because the adaptive/dynamic system is more functional. Adaptive/dynamic systems can motivate participants because they react to the scene in real-time, which provide players with feedback, participants can feel more autonomy and competence because the systems are flexible, they offer participants a higher feeling of control because they are reactive, they can immerse players more because they can adaptive dynamically to the scene, and they increase effectance because they are reactive.

Participants believe that adaptive/dynamic systems which react to the scene provide the player with information about the scene, essentially acting as a form of player feedback. Some participants believe that as long as the VGM is liked and does not irritate, or disengage the player, then repetition should not be a problem in adaptive/dynamic music systems, and the implementation of these systems

improves the VGM. One participant prefers adaptive/dynamic music systems because they are more flexible than older interactive music systems. The participant feels that they have more control and agency when adaptive/dynamic music systems are implemented, and that these systems provide the participant with more relevant feedback. One participant believes that the use of adaptive/dynamic music depends on whether they are engaging with a single player or multiplayer game. The participant prefers not to listen to VGM in multiplayer games they have invested a lot of time into due to overfamiliarity with the repeating VGM. The participant prefers this because they can employ their own user-selected playlists, which they can customise and personalise. Another participant believes that players should appreciate the difficulty involved with producing unique VGM and that adaptive/dynamic music is a good approach, and technique, used to reduce repetition where repetition of VGM in video games is inevitable.

Background, Catchiness, and the Non-Memorable

The implementation of VGM repetition when it remains in the background is tolerated more by participants and can have a negative effect on their hedonic, affective, and cognitive video game enjoyment if it does not remain in the background. It can also have a negative impact on their immersion, presence, and suspension of disbelief because the VGM becomes the focus of participants' engagement. Some participants appreciate the implementation of VGM which is non-memorable, not catchy, and remains in the background because it reduces and conceals repetition. Some participants believe that repeating VGM should be memorable and catchy because it adds identity to video games and can become iconic. Some participants prefer catchy VGM, in the form of leitmotifs, in some scenes because they believe that the catchy leitmotif should be iconic and give identity to that scene. Some participants believe that catchy VGM which is familiar, iconic, and adds identity to a video game can make video games memorable. One participant believes that VGM should be memorable, catchy, and does not have to remain in the background because VGM, and its repetition, has important roles and functions in video games. They believe that non-memorable VGM leads to dull, forgettable, and emotionless VGM. One participant believes that the implementation of non-memorable, and non-catchy VGM, is not a valid approach and technique. The participant does not think it should be used to reduce and conceal repetition of VGM. They also believe that memorable VGM, which repeats, can become familiar to players more quickly because it is catchy, and that catchy VGM increases hedonic video game enjoyment. The participant does believe that VGM should remain in the background but only because it should not be the focus of engagement and not because of VGM repetition. When VGM is an integral part of the gameplay, the participant prefers memorable VGM.

Some participants believe that success or failure in the approach and technique of avoiding catchy VGM depends on their liking or disliking of catchy VGM. Some participants believe that the VGM should be liked if it is catchy and that their liking of catchy VGM can increase with familiarity due to repeated exposure. Some participants prefer catchy VGM because it is easier for them to become familiar with the catchy VGM due to repeated exposure, and believe that the use of non-memorable VGM can diminish this. When one participant becomes familiar with a catchy scene appropriate leitmotif, they recognise revisited scenes. Some participants explain that they become overfamiliar with the repeating VGM, or overused VGM, and that catchy VGM can emphasise the repetition. Some participants are less tolerant of catchy VGM which repeats when they dislike the VGM because they are more aware of the repetition, and this has a negative impact on their hedonic, and cognitive, video game enjoyment, and their immersion is diminished.

Sometimes the catchiness of repeating VGM can be scene dependent for participants. Some participants believe that the VGM does not need to be catchy, and prefer non-memorable leitmotifs to remain in the background when the leitmotif is appropriate to a scene which does not have much gameplay, such as when the player is exploring the video game environment. In scenes that require an iconic theme or have more intense gameplay, such as combat, some participants have the perspective that scene appropriate VGM should be catchy. These participants prefer repeating catchy VGM, which provides player feedback in scenes, because it aids and guides them and focuses them. However, one participant prefers non-memorable VGM when they are engaged in scenes where a leitmotif provides them with feedback because they believe that it is not the role and function of the leitmotif to be catchy. One participant believes that repeating VGM which remains in the background, is non-memorable, and is not catchy, may not be important if the repeating VGM is implemented appropriately into scenes. Sometimes video game genres can dictate whether VGM should be non-memorable or catchy. Some participants prefer non-memorable VGM implemented into video games that have a lot of player agency or multiplayer games, because of the size and the time invested into those genres of video game mean they can become overfamiliar with memorable, and catchy, VGM which repeats. Some participants prefer catchy VGM, which does not have to remain in the background, in more linear video game genres such as FPS or retro games because it focuses and motivates them.

Silence and Foreshadow

Some participants prefer constantly looped VGM while others appreciate the implementation of silence. Some participants believe that both looped VGM and interactive music are valid approaches, and techniques. They explain that the implementation of either approach and technique is dependent

on the appropriate scene, and video game genre. Some participants prefer the implementation of interactive music because it reduces looped VGM and they believe that silence can be appropriate in certain scenes, which can improve their cognitive video game enjoyment. Some participants appreciate interactive music because they hear the VGM begin to play again when the scene changes and can use this as a form of feedback, which notifies them that the scene has changed. Another prefers interactive music because silence is heard after the player has completed an aim or goal, such as killing a boss, which provides them with feedback and can calm them. Interactive music increases these participants' affective, cognitive, and behavioural video game enjoyment with regards to immersion, presence, autonomy, competence, effectance, and control. One participant prefers silence because they can focus on the scene and believe that looped VGM can be distracting, disturbing, and intrusive. In scenes where a scene appropriate leitmotif provides the player with feedback, they prefer looped VGM because they can become familiar with the leitmotif, which helps the participant with the learning curve of the video game. The looped VGM in this context can be low complexity but should be non-memorable and remain in the background to avoid overfamiliarity.

Participants that prefer looped VGM to be constantly playing believe that VGM that fades to silence can be irritating and jarring when not implemented correctly. Liking the looped VGM can mean that some participants are more tolerant of looping. Some participants prefer looped VGM in scenes because the looped VGM can help them to focus and it can motivate them, silence can bore them in a scene, and VGM can mask the silence. These participants believe that looped VGM improves their hedonic, affective, cognitive, and behavioural video game enjoyment. Participants that prefer silence believe that it does reduce looping of VGM in video games which annoys them. Some participants explain that they prefer silence in scenes which have less gameplay, such as exploration, because silence is appropriate to that scene which can help to create mood. Silence in this context improves their cognitive video game enjoyment because their presence increases, they feel more immersed, their disbelief is suspended, they feel motivated, and are transported into the game world.

Some participants believe silence is better implemented as a form of foreshadowing rather than to reduce repetition. Participants believe that silence as a form of foreshadowing has an important functional role which increases tension, suspense, fear, anxiety, and atmosphere in certain video game genres, such as horror games, and has a positive impact on their engagement. Silence used as foreshadow can also provide participants with feedback about an upcoming intense scene such as a boss battle.

Variation

Participants are appreciative of the implementation of variation used to reduce and conceal repetition of VGM, where its implementation increases their video game enjoyment. Participants can become bored of repeating VGM which is used every time participants re-enter scenes. Variation can help reduce the repetition which disconnects them from the video game. Variation in this context can improve participants' hedonic and cognitive enjoyment because they can appreciate the variations of repeating VGM. Some participants believe that variation of leitmotifs are a good compromise because they can still continue to communicate meaning to the player without leading to overfamiliarity and listener fatigue. This can increase the participants' eudaimonic and cognitive enjoyment because participants can appreciate the implementation of variation as it reduces repetition and continues to allow the VGM to have a functional role, which can increase immersion. Some participants believe that variation is dependent on VGM complexity. Variation is more suited to low complexity VGM which repeats because repeating low complexity VGM can become overfamiliar very quickly, which can have an impact on hedonic video game enjoyment.

Some participants believe that variations help them to focus on the scene and can motivate them in a scene. One participant believes that the approach, and technique, of implementing variation which reduces, and conceals, repetition can have a low cost with regards to creating and implementing the variations. One participant can appreciate, and expects, variation when it is implemented into an adaptive/dynamic music system because it can still provide feedback through the use of leitmotifs while reducing repetition. The participant explains that when they become familiar with the variations of the leitmotif they perceive these systems to have a functional role with regards to the leitmotif and feedback. This participant's cognitive video game enjoyment and immersion is not diminished by overfamiliarity because they can understand the functional role of a repeating leitmotif. Their hedonic, affective, and cognitive enjoyment can be increased by variations of a leitmotif when it is implemented into adaptive/dynamic music systems.

However, participants believe it is important that the variations remain familiar to them and not be overused because repeating VGM can have an important functional role for them. Participants believe that there should be a balance between variation and familiarity, where excessive variation can be confusing for the player. For example, participants discuss that variations of leitmotif that communicate meaning to them, and provide them with feedback, should remain familiar to them so that they can recognise the meaning that the leitmotif is trying to communicate to them, and continue to provide them with appropriate feedback. Participants believe that if too many variations of a leitmotif are implemented, then feedback can be diminished because their familiarity with the

leitmotif is reduced or hindered. As long as familiarity with the variations of a leitmotif continues to provide them with appropriate feedback, participants believe that variation can increase their cognitive video game enjoyment. Repeated exposure to a small number of variations of a leitmotif can retain familiarity and continue to provide the appropriate feedback for participants. Some participants believe that variations of an iconic theme reduce repetition but the variations should still be familiar, they look forward to hearing the variations of that familiar iconic theme, and believe that variations of an iconic theme can create a different mood, and atmosphere, while remaining familiar.

User-Selected and Licensed Music Playlists

Participants can sometimes replace disliked VGM, which repeats, with their own user-selected playlists. This can increase their hedonic, affective, and behavioural video game enjoyment because the user-selected playlists are familiar, and liked, which can improve their performance, motivation, and immersion. Some participants employ user-selected playlists into video games when the VGM becomes overfamiliar to them. One participant does employ their own liked music in the form of user-selected playlists in video games when they become overfamiliar with the repeating VGM. The participant becomes satiated, bored, and suffers listener fatigue due to overuse of repeating VGM, player delay, and a limited amount of VGM implemented into video games. The participant will either substitute the VGM with their own user-selected playlists or completely stop engaging with the video game. One participant employs their own user-selected playlists but does not let them repeat, instead choosing music genre playlists that they hedonistically enjoy at the time. These user-selected playlists remain in the background for the participant, however, if they like the video game's VGM they will not employ user-selected playlists, even if the VGM repeats. One participant does not employ user-selected playlists when they are engaging with video games because they appreciate the VGM of the video game. The participant appreciates listening to VGM outside of their engagement with video games and the VGM can make them recollect the video game. Sometimes the participant replays video games, which they liked the VGM of, just so that they can listen and appreciate the VGM of that video game.

Some participants believe that the use of user-selected playlists is dependent in the video game genre. Certain genres of video games, such as RPGs, and multiplayer games, such as MMORPGs, require more time investment by the player. This can lead to overfamiliarity with the repeated VGM which causes listener fatigue, satiation, and boredom for the player even if participants like the VGM. Participants employ their own user-selected playlists with these genres of video game, which can help remove VGM repetition and allow them to continue engaging with the video game. One participant will not employ user-selected playlists in single player games that they invest a lot of time into and have a lot

of player agency. They believe that their own user-selected playlists have a negative impact on their immersion, presence, and suspension of disbelief. One participant will employ user-selected playlists into multiplayer games that they have invested a lot of time into because they are familiar with the video game, and do not require the feedback provided by the repeating VGM. When they employ user-selected playlists they believe their engagement is personalised and their hedonic, affective, cognitive, and behavioural video game enjoyment increases because their own music is familiar, and liked. One participant explains that they will employ user-selected playlists when they are overfamiliar with the repeating VGM in single player and multiplayer games they have invested a lot of time into, even when they like the VGM. One participant believes that single player and multiplayer games that players invest a lot of time into have different engagement from each other. The participant believes that multiplayer games that players invest a lot of time into can require teamwork and that can lead to player delay as they wait for other members of their team. In those situations the participant will employ user-selected playlists or choose liked, and familiar, music from a licensed music playlist if it has been implemented.

Participants agree that the use of user-selected playlists can hinder and diminish feedback provided by repeating leitmotifs, which communicate meaning to the player. One participant will employ user-selected playlists into genres that have simpler gameplay such as browser games, and strategy games such as turn-based strategy games where they do not require feedback provided by repeating leitmotifs. However, in most single player games, the participant will not employ user-selected playlists because their own liked music will interfere with the feedback provided to them by a repeating leitmotif, which communicates meaning to the player. Some participants find the use of their own music in user-selected playlists to be distracting and can interfere with their performance, and engagement. Participants explain that this is because they are familiar with the liked music from their user-selected playlists and tend to focus on their own music rather than concentrating on the video game. Some of these participants will mute the repeating VGM if they are overfamiliar with it, or they dislike it, instead of employing user-selected playlists because their own music distracts them and they wish to continue engaging with the video game.

Some participants employ user-selected playlists strategically in video games to improve their performance, focus, and engagement. These participants will choose liked and familiar music for certain types of gameplay, such as combat, and create user-selected playlists for those scenes which involve that type of gameplay. Participants will reuse these playlists with certain kinds of engagement, such as a favourite playlist used for combat scenes, which can be a form of repetition. However, because participants are familiar and like their own playlists, repetition is not as much of a problem, even if participants are overfamiliar with the user-selected playlist. Sometimes even liked VGM can be

replaced by the participants' own user-selected playlists because they use their own liked music strategically. The use of user-selected playlists can also improve the participants' mood with the video game because their own music creates a personalised experience. One participant will sometimes employ user-selected playlists into action orientated video game genres, such as FPS games, because they believe that their own music helps them to focus and improves their performance. The participant will strategically use familiar user-selected playlists to motivate them, increase their flow, and help them engage. In this context repetition of the participant's user-selected playlists occur because they will use familiar playlists for specific kinds of engagement, such as a specific user-selected playlist to help them in combat scenes of video games. One participant believes that players employ user-selected playlists into competitive multiplayer games because they are indifferent to the VGM of those video game genres.

Participants appreciate the implementation of licensed music playlists in appropriate scenes and genres of video games, which increase their hedonic video game enjoyment. If participants are delayed in a scene in a video game that employs licensed music playlists, they usually have the choice of changing the music (skipping the track) to a piece of licensed music which they like or prefer. One participant explains that they will not repeat liked or preferred music in a licensed music playlist, but will not listen to disliked music. Participants will also customise and personalise licensed music playlists in certain genres of video games, such as sports games or racing games, with music that they prefer or like, and remove disliked licensed music. This can help them engage with the video game and increases their hedonic video game enjoyment with liked licensed music, but it can also increase their autonomy and cognitive enjoyment because the video game allows them to customise, and personalise the licensed music playlists, which can immerse them and motivate them. However, one participant prefers not to customise and personalise licensed music playlists in racing games because they believe that the licensed music is not the focus of those genres of video game, and should remain in the background. Due to the costs involved with implementing licensed music, repetition will occur because of the limited amount of music available. One participant gets sated with overfamiliar licensed music which is repeated. Some participants customise and personalise licensed music playlists with licensed music they prefer and this can reduce the amount of music even more, which leads to repetition when they repeat preferred music. However, as participants become more familiar with their preferred licensed music, their liking also increases and they are more appreciative of the repetition of that liked music.

When participants customise and personalise licensed music playlists it is because liked and preferred licensed music can help them focus, engage, and improve their performance. One participant believes that licensed music playlists can make certain video games iconic, such as open-world games, add to

the identity of those video games, and that players expect those genres of video games to include licensed music playlists. The participant also believes that repetition of music in licensed music playlists is not a problem in those video game genres because the player is not delayed in scenes that include the playlists for long periods of time, and does not become overfamiliar with the licensed music. The participant believes that licensed music playlists can suspend their disbelief.

Music Preference Tools

Most participants are not aware of music preference tools. Some participants appreciate the concept and the implementation of music preference tools because the system can be useful in creating unique engagement, and removing repetition of VGM. One participant believes that music preference tools that adapt dynamically to the scene can help them focus and engage with a video game, which would create personalised engagement. One participant appreciates the concept of music preference tools because they engage with video games genres that implement licensed music playlists, such as sports games. The participant would prefer to employ their own music into those genres of video game and becomes overfamiliar with licensed music playlists. The participant believes that their own familiar and liked music in such a system motivates them to engage with those genres of video game. One participant suggests that the music preference tool system should not be a replacement for the video game's VGM but can be implemented as an alternative. The participant believes that the system can be useful when they dislike the repeating VGM, where they can substitute the disliked VGM with the system.

Some participants believe that music preference tools can be useful in both single player and multiplayer games. Some participants believe that music preference tools are more suited to single player games because they usually communicate with other players in multiplayer games and mute the VGM. One participant does not believe that music preference tools should be implemented into single player games because such a system would diminish their feedback, immersion, presence, and cognitive enjoyment. The participant believes that a leitmotif, which communicates meaning to the player, would be removed by implementing music preference tools even if the system can convey moods. However, the participant can appreciate its implementation in a multiplayer game or mobile game. Participants prefer the system in multiplayer games because they can invest a lot of time into those genres of video game and can become overfamiliar with the repeating VGM. One participant explains that the system can create unique engagement with multiplayer games because the system can match the player's own music with the type of player avatar they are choosing to play with. One participant comments that music preference tools can be employed into multiplayer games because

players do not need the feedback provided by leitmotifs in multiplayer games as they are familiar with the gameplay of those video games.

Some participants believe that music preference tools can be a good approach and technique but are concerned that the user-selected music may not be appropriate to the scene. Participants have an issue with playlist categories which may not accurately match the scene and could contradict the scene. This can mean that the system does not provide appropriate and sufficient feedback to the player. Participants also believe that the important functional role that a leitmotif has in communicating meaning to the player and providing them with appropriate feedback could be lost. One participant believes that music preference tools could be a valid approach and technique used to remove repetition of VGM. However, the participant understands that such a system could remove, diminish, and hinder the functional role that a repeating leitmotif provides. The participant explains that this repeating leitmotif is better at being scene appropriate and identifying moods than music preference tools. Some participants would consider music preference tools but remain dubious about their functionality and ability to substitute VGM in video games. One participant does not believe that such a system would remove the feedback provided by a leitmotif because they normally engage with video game genres which do not require player feedback, such as sports games. However, they do appreciate that for other players the loss of player feedback could be an issue.

Some participants would not consider music preference tools and would not use those systems in their video game engagement. One participant would not consider the implementation of music preference tools because their own music distracts them, and the participant will just mute repeating VGM if they become overfamiliar with it. Another participant would not use such a system but can appreciate the concept of music preference tools, and believes that hedonic video game enjoyment would increase for players who do use such as system because their own music is familiar, and liked. One participant believes that music preference tools can confuse the player because the player would only hear segments of their own music which could irritate, annoy, frustrate, and disengage them. The participant understands that the system could work better in scenes where the player is delayed because it gives an opportunity for entire pieces of music to be played. One participant believes that the implementation of a music preference tool system would remove the aesthetic of the video game.

Procedural Audio

Most participants have no experience with procedural audio but are appreciative of its implementation in removing repetition of VGM. However, participants believe that the implementation of such a system would also remove their familiarity with certain aspects of VGM, such as the leitmotif. Participants think that a lack of a familiar soundtrack would have a negative

impact on the VGM's functional role to provide accurate player feedback. They can appreciate the implementation of procedural audio but they acknowledge that these systems can remove, diminish, and hinder the communication of meaning that leitmotifs provide. They suggest that if procedural audio systems are implemented they would have to maintain familiar leitmotifs. Some participants believe that familiarity with iconic themes adds identity to video games, and that procedural audio would remove this familiarity.

Participants believe that procedural audio can be more suited to certain genres of video games and not to others because they remove familiar leitmotifs. One participant believes that procedural audio would work better in horror games where having unique VGM adds to the mood, atmosphere, and tension of those video games. The participant believes that familiarity with a leitmotif can provide excessive information to the player in those video games. For example, the player can become familiar with a leitmotif which warns them of danger through repeated exposure to that leitmotif. This can give the player an unfair advantage and removes any tension from the scene. Procedural systems would remove that familiarity but could still provide the player with feedback in a scene because those systems are adaptive/dynamic. This participant also can appreciate the implementation of procedural audio into abstract genres of video games, such as SHMUPs, because of the simple gameplay of those genres of video games. Another participant believes that procedural audio is more suited in video game genres where the player invests a lot of time into and becomes overfamiliar with the repeating VGM. Open-world games, which provide the player with a lot of agency, could benefit from procedural systems but the participant believes that developers prefer more control in linear video game genres.

Single Player and Multiplayer

The difference in engagement in single player and multiplayer games impacts how some participants perceive repetition of VGM. VGM repetition in multiplayer games can be more tolerable because some participants view the VGM in those video games as not being as important compared to single player games. Participants agree that the way they listen to VGM in single player games is different compared to multiplayer games. One participant understands the important role and function that repeating VGM plays in single video games, but will reduce the volume of the VGM so that they can listen to the rest of the audio. One participant believes that players mute VGM in multiplayer games because of the different kind of gameplay and engagement in multiplayer games, and not because of the repetition of VGM. One participant thinks that developers understand the different role and function VGM plays in single player, and multiplayer, games where developers will purposely implement VGM, which remains in the background, in multiplayer games.

Participants tend not to mute the repeating VGM in single player games because it has an important functional role, which provides them with player feedback through the communication of meaning. One participant will not mute the VGM in single player games because the repeating VGM is scene and video game genre appropriate, and the repeating VGM remains in the background. The participant tolerates the repetition in that context. One participant feels more immersed and engaged with the VGM in single player games, and requires the functional role that the VGM provides in single player games. Participants tend to become bored with overfamiliar repeating VGM in multiplayer games, which players invest a lot of time into, because they can spend hundreds of hours engaged with those genres of video game. Most participants do mute VGM in multiplayer games when they are communicating with other players. However, this is because they find the VGM intrusive and not because they are overfamiliar with the repeating VGM. In multiplayer genres, such as competitive multiplayer games, some participants will mute the VGM but not because of VGM repetition, instead they believe that silence can help them to focus and increases their performance. One participant explains that they will mute the VGM when they are engaging with a multiplayer game that they have invested a lot of time into, even when they are not communicating with other players. The participant will not do this due to overfamiliarity because in their single player engagement with the exact same video game they continue to listen to the repeating VGM.

Retro Video Games

Participants are more appreciative and tolerant of the looping, and repetition, of VGM in retro games because they understand the technological constraints of the video game hardware, and the limited memory available. One participant is less tolerant of looping in modern video games because they believe that modern games do not have the same technological constraints that retro games had. One participant believes that the role and function of looped VGM in retro games was not as important as VGM is now in modern video games.

Participants appreciate the iconic aesthetic of retro game VGM, which includes looping. This can also be very nostalgic and familiar for participants. One participants appreciates catchy looping VGM in retro games and enjoys engaging with retro games unless they annoy him. The participant's nostalgia stems from the familiarity of playing those games when they were younger. One participant engages with retro games because of nostalgia but will disengage with them after they become sated with them. Looped VGM adds to their hedonic enjoyment of retro games but their cognitive enjoyment is dependent on whether they notice the looping. If they do notice looping, the VGM can become overfamiliar and leads to listener fatigue, and satiation. The participant replaces the looped VGM which bores them with user-selected playlists until they prefer to listen to the VGM again. One

participant appreciates the implementation of looped VGM where repeated exposure increases their familiarity with the looped VGM. However, overfamiliarity can lead to the participant becoming indifferent to the looped VGM, and bored of it, even if the looped VGM is catchy. The participant believes that looped VGM of retro games add to the iconic identity of those video games. Overall the participant believes that looped VGM in retro games has a positive effect on their hedonic, affective, cognitive, and behavioural video game enjoyment.

One participant appreciates chiptune when they are not engaged with video games and looped VGM in retro games because of nostalgia. The participant never becomes sated with the repetition of looped VGM in retro games. One participant believes that the more familiar they become with the looped VGM from retro games the more the repetition begins to fade into the background. One participant has a very negative perspective of the looping and repetition of VGM from retro games which has a negative impact on their hedonic, affective, cognitive, and behavioural video game enjoyment. They are tolerant of looped VGM in retro games when the VGM is liked and catchy. However, they believe that looping of VGM in retro games can be irritating, annoying, non-pleasurable, intrusive, and tedious because of the low complexity of the looped VGM. The participant especially dislikes the catchiness of looped VGM when it is low complexity.

Most participants believe that looping of VGM in video games created in the style of retro games is appropriate to the genre and expected because of nostalgia, the iconic aesthetic of retro games they are trying to recreate, and the identity that looped VGM gives those genres of video game. One participant believes that modern video games should not implement looped VGM and the VGM should be high complexity. Another participant believes that retro styled games that have more complex gameplay and engagement can employ higher complexity VGM. One participant prefers the looped VGM in video games created in the style of retro games to remain in the background. However, they appreciate its implementation into retro styled games when it is appropriate to the genre. One participant believes that video games created in the style of retro games should not implement looped VGM even if they appreciate the reason that developers choose to do so. The participant believes that modern video games created in the style of retro games do not have the technological constraints of retro games and should not be limited by them.

Future

Participants do not view repetition of VGM to be a significant problem that requires a drastic solution, and generally believe that repetition will continue to be a part of video games in the future. One participant believes that unless systems are trialled that reduce, conceal, or remove repetition in commercial video games, and have been proven as widely successful, then repetition will continue to

be implemented into video games. The participant believes that even if these systems do exist and are successful, repetition of VGM, especially looping, will be an important aesthetic of video games and their culture in the future. However, the participant believes that there is a possibility that looping will be replaced in the future if the technology improves. One participant appreciates the role and function of repetition in video games with regards to repeating, and familiar, leitmotifs. The participant believes that this functional role that repetition provides will continue into the future because they improve player engagement. One participant believes that repetition will continue to be an aspect of single player games because it is more appropriate to those genres of video game. The participant believes that repetition has a functional role to provide player feedback in single player games, such as FPS games. The participant thinks that repetition will not continue to be implemented into multiplayer games because they have different gameplay and do not require the functional role. One participant believes that repetition will continue to be implemented into video games of the future because it is important from an industry, consumer, and technical perspective. The participant believes that the cost of creating a video game is taken up by the consumer and that repetition of VGM can keep these costs low. One participant believes that repetition of VGM is a valid approach and technique that has worked in the past, works in the present, and will continue to work in the future because repetition is not a problem, but will continue to be refined in the future. One participant does not think that VGM repetition is a problem and should not be removed in the future, the participant appreciates its implementation and believes that the current approaches, and techniques, used with regards to repetition of VGM are sufficient.

CONCLUSION

This study attempted to answer the question whether the repetition of VGM actually disengages players, it has attempted to clarify some of the ambiguity and confusion that surrounds VGM repetition, and has shown that repetition of VGM has an important future in video games because it increases players' video game enjoyment, and engagement. The purpose of this study was to examine the phenomenon of VGM repetition on video game enjoyment, and to gauge how best to manage repetition using approaches, and techniques, implemented to conceal, reduce, and remove repetition of VGM. Generally speaking, Interviews with video game players reveal that repetition can make VGM overfamiliar for players, which reduces their enjoyment. However, players welcome and expect the functional role that a leitmotif has with regards to player feedback when it becomes familiar to the player through repeated exposure, and prefer the leitmotif to be implemented in an adaptive/dynamic music system. This means that players generally appreciate and tolerate VGM repetition when it has a functional role in video games.

Engagement, Repetition, and Interactivity

Players generally believe that repetition itself is not a significant problem in video games which requires a drastic solution. Players understand that VGM is listened to differently in video games because of interactivity, and understand why VGM repeats. However, that does not mean that repetition of VGM does not have an impact on their video game enjoyment or that players do not have some issues with VGM repetition. Players can appreciate and tolerate repetition, and understand that it can have a positive impact on their enjoyment. Players believe that their enjoyment of video games with regards to repetition of VGM is contextually dependent on whether its implementation actually improves engagement.

Familiarity, Liking, Complexity, and Overfamiliarity

Players confirm the relationship where familiarity increases with repeated exposure to VGM, which increases liking and reduces subjective perceived complexity. However, this can lead to overfamiliarity with VGM which can cause listener fatigue, boredom, and can sate the player. Players' subjective perceived complexity can decrease with high complexity VGM as they become more familiar with it. Players are more tolerant of repetition of high complexity VGM because they are more aware of the repetition in low complexity VGM, and sometimes players do not even notice the repetition in high complexity VGM. As long as repeating VGM does not become overfamiliar players tend to tolerate repeating VGM. Overuse of the leitmotif technique can cause the leitmotif to lose its meaning.

Leitmotif and Theme

Players appreciate the implementation of repeating leitmotifs which communicate meaning because they provide feedback about the scene, identify characters, settings, narrative and mood, they aid and guide the player, help with the aims and goals, focus the player, and help with the learning curve of the game. Players appreciate repeating leitmotifs because they provide feedback without providing them with excessive amounts of information. Players believe that familiarity and feedback have a relationship. As players become familiar with repeating leitmotifs when they re-enter scenes they learn to associate a leitmotif to a scene. When they hear that leitmotif again they immediately recognise it and understand the information it is attempting to convey about that scene. In this context familiarity has a functional role, which provides that player with an additional layer of feedback. This can be especially important to players in video games when they do not have a visual form of feedback, or in video games that have a lot of player agency. Repeating and familiar leitmotifs can also act as a form of foreshadow for players. Liking of the leitmotif can improve players' perception of repetition. Even if the repeating leitmotif is disliked players still appreciate that it has a functional role in providing them with feedback. Leitmotif, which continues to loop until the player has completed the objectives of the scene, is appreciated by players because it provides them with feedback.

Players appreciate the implementation of iconic themes, and their variations, which add a sense of continuity as they progress through a video game. Players also appreciate and expect familiar iconic themes, or their variations, to be repeated across iterations of video game franchises because it gives that franchise a sense of unity. Familiarity with these iconic themes helps players to remember the previous iterations of a video game franchise. These familiar iconic themes can give video games their identity and players appreciate this because they associate certain iconic themes to certain video games, and their franchises. Iconic themes can act as a form of brand awareness for the video game and its franchise.

Scene and Genre Appropriateness

Players appreciate and tolerate repetition in the context of video game scene appropriateness because the repeating VGM has a functional role with regards to providing the player with feedback about the scene. Players can prefer variations of scene appropriate leitmotifs especially when the variations provide additional feedback about changes in scenes that they re-enter. Players believe that scene appropriate VGM which repeats, can be more important in certain action genres of video games because it provides them with feedback about intense scenes.

Players are generally more accepting, and tolerant, of VGM repetition when it is video game genre appropriate. Repetition can become more obvious and contradictory to the video game genre if the VGM is not appropriate. Players can tolerate repetition more in simpler or more abstract genres of video game, such as mobile games, because they have less complex gameplay and players may not engage with them for long periods of time.

Player Delay

Players generally appreciate looped scene appropriate VGM when they are delayed in a scene because it provides them with feedback. However, this can be an issue if the game glitches and the VGM continues to loop even if they have completed all the objectives of the scene, but they understand that this can happen because of the technological constraints of video games. Players that are negatively impacted by repetition when they are delayed in scenes believe that high complexity looped VGM is more acceptable. Low complexity VGM which repeats due to player delay can bore these players because of overfamiliarity. Sometimes this overfamiliarity can cause players to mute the repeating VGM when they are delayed in scenes. Players believe that timing cues that fade the looped VGM into silence can be a possible solution to VGM repetition with regards to player delay if they are overfamiliar with looped VGM.

Adaptive/Dynamic Music

Players prefer adaptive/dynamic music over looped VGM because it is a flexible system that reduces repetition and reacts to the scene. Adaptive/dynamic music is expected in modern video games by players because it is functional with regards to providing real-time player feedback. Players are more tolerant of repeating leitmotifs when they are implemented in an adaptive/dynamic system because of the functional role the repeating VGM has with regards to player feedback. Players can appreciate the use of variations of familiar leitmotifs and themes when they re-enter scenes if it is implemented as adaptive/dynamic music. Adaptive/dynamic music systems can be a valid approach because players understand that creating unique VGM for every scene is impossible.

Background, Catchiness, and the Non-Memorable

Players understand that VGM should be non-memorable in order to reduce and conceal repetition. However, some players believe that repeating VGM should be catchy because it adds identity to a video game and that the VGM, and video game, can become iconic. Sometimes catchy and memorable VGM can be implemented into certain iconic scenes because it has a functional role, which adds identity to that scene. The catchiness of the VGM can help players become familiar with the repeating VGM. This can increase their liking of catchy VGM and can also be important when it repeats. However,

if the catchy VGM is disliked repeated exposure can lead to overfamiliarity quickly as the repetition is emphasised. Catchiness of repeating VGM can be scene and genre dependent for players. For scenes that have less gameplay, players can prefer non-memorable VGM which remains in the background, but prefer catchy VGM in scenes which are more intense and require player feedback. Players can prefer non-memorable VGM in genres of video game which require more time investment, such as multiplayer games, because they can become overfamiliar with the repeating VGM. Catchy VGM can be preferred in linear genres of video game and retro games. However, players tend do believe that VGM can remain in the background because it is not the focus of engagement.

Silence and Foreshadow

Players believe that silence and constantly looping VGM are both valid approaches, and techniques, used in video games which can be dependent on the scene in a video game, and genre, of a video game. Players believe that looped VGM is more appropriate in certain scenes where they require feedback from a familiar leitmotif, while silence is more appropriate in scenes where there is less gameplay. Players that prefer silence believe that silence, especially implemented through interactive music systems, reduces repetition. Silence can be appropriate in certain scenes for players because it helps to create mood. Sometimes when VGM is played after a period of silence, it can signify that the scene has changed, and can act as a form of feedback for players. This also works when players have completed the aims and goals of the scene, and hear silence signifying that the scene has changed, which provides players with feedback. Players that prefer looped VGM believe that silence can be irritating and jarring when not implemented correctly. These players believe silence to be boring, and looped VGM can help them focus. However, players believe that silence can be better used as a form of foreshadowing rather than as an approach and technique used to reduce repetition of VGM. In this context silence can be used to increase tension, suspense, fear, anxiety, and atmosphere in certain genres of video games, such as horror games. It can also be used as a form of feedback, foreshadowing an approaching intense scene for players.

Variation

Players understand that the implementation of variation can be used to reduce and conceal VGM repetition. Players do not tend to become overfamiliar with repeating VGM when variation is employed. Variation can be a good compromise for players because leitmotifs, which provide player feedback, can remain familiar to players while not becoming overfamiliar to them as long as there is a balance between variation and familiarity. This allows the familiar leitmotif to continue to have a functional role with regards to player feedback. Overuse of variation can also have an impact on familiar iconic themes that are used to add identity to a video game, and give a sense of continuity to

that video game, because players associate those familiar themes to those particular video games, and to specific scenes in those video games. This also applies to variations of iconic themes, which are implemented across a video game franchise, where players expect variations of those iconic themes across the different iterations of those games to remain familiar. Players believe that variation can be a more useful approach and technique for low complexity VGM which can become overfamiliar more quickly than high complexity VGM.

User-Selected and Licensed Music Playlists

Players can employ customised user-selected playlists that create personalised experiences, which can remove repeating and overfamiliar VGM for players. However, this can be dependent on the video game genre because certain genres require more time investment from players. Single player genres such as RPGs and multiplayer genres such as MMORPGs can require many hundreds of hours of engagement, which leads to overfamiliarity with the repeating VGM. In these contexts players tend to employ user-selected playlists to help sustain their engagement. Players sometimes employ user-selected playlists strategically to improve their performance, focus, and engagement. These players choose liked and familiar music for certain types of gameplay in certain scenes, and reuse them for similar scenes, which leads to repetition of their user-selected playlists. However, players tend to tolerate the repetition because the music is liked and familiar. User-selected playlists can sometimes distract players and interfere with their performance because their own music is liked, familiar, and preferred. Players can focus on their own music in this context rather than engaging with the video game. Also, user-selected playlists can diminish and hinder feedback provided by repeating leitmotifs which communicate meaning.

Licensed music playlists are appreciated by players when they can be customised and personalised. This allows them to choose licensed music that they like and prefer. However, this can mean repetition occurs because music is replayed from a limited playlist, but as players become more familiar with licensed music they like and prefer, they can become more tolerant of the repetition. When licensed playlists are used diegetically, such as radio stations, players can suspend their disbelief and believe that repetition is not a problem.

Music Preference Tools

Players appreciate the concept and implementation of music preference tools because it can reduce repetition of VGM and can create unique, and personalised, engagement. The music employed is from their own liked and familiar user-selected playlists. However, music preference tools only use segments of the players' own music which can confuse, annoy, and disengage them. Players can be

concerned with the functionality because they believe that the system cannot accurately match their own music to the scene, which can contradict the scene. These players believe that the system cannot provide them with appropriate and sufficient feedback about the scene, which a familiar leitmotif can in that functional role. Also, players believe that the use of their own music removes the video game aesthetic that the VGM would provide, which can give a video game its identity. Players feel that music preference tools can be more suited to certain genres of video games, such as sports games and multiplayer games, because those genres employ licensed music which does not provide any feedback or employs VGM that players feel is not important to their engagement.

Procedural Audio

Players are appreciative of procedural audio even if many feel they have no experience of using such a system. Procedural audio is a valid system that removes repetition of VGM and players agree with this. However, players believe that such systems remove their familiarity with important leitmotifs and iconic themes. Procedural audio can diminish the functional role that familiar leitmotifs have with providing player feedback, and procedural audio can hinder familiarity with iconic themes which give video games their identity, continuity, and unity. Players do believe that certain genres of video game could benefit from procedural audio, such as horror games and open-world games, because procedural audio can be more suited to those genres.

Single Player and Multiplayer

Players believe that the way they listen to VGM in single player games is different compared to multiplayer games, and their perception of repetition can also depend on this. Players believe that the role and function of repetition is more important in single player games than in multiplayer games due to the different gameplay involved. They believe that VGM has a more diminished role and function in multiplayer games. Players do not tend to mute the repeating VGM in single player games because repeating VGM has an important functional role in providing player feedback. Players do mute the VGM in multiplayer games but not necessarily because of repetition. Players will mute the VGM so that they can communicate with other online players. Sometimes players will mute the VGM in competitive multiplayer games to help them focus on their performance. However, this is different for multiplayer games that players have invested a lot of time into and are overfamiliar with repeating VGM. Players in this context will mute the VGM because they are sated, bored and suffer listener fatigue. Players will also mute repeating VGM in single player games they have invested a lot of time into. Players believe that they do not require the feedback provided by repeating, and familiar, leitmotifs in those genres of video game because they are familiar with the gameplay.

Retro Video Games

Looped VGM, which is usually low complexity, implemented into retro games is more appreciated and tolerated by players. This is because players tend to understand the technological constraints and memory limitations of retro game hardware. Players also appreciate looping in retro games because it is an important part of the iconic aesthetic identity of those games, and looping adds to their nostalgia of those games. Their video game enjoyment can increase because of the nostalgia they feel, but their enjoyment can decrease because of overfamiliarity. Players appreciate the implementation of early adaptive/dynamic music systems in retro games, which increased the tempo of looped VGM when their avatar was in danger. Players generally appreciate and expect looped VGM to be implemented into modern video games created in the style of retro games because it is appropriate to that genre of video game. However, retro styled games, which have more complex gameplay, can implement high complexity VGM and use modern approaches, and techniques.

Future

Players believe that repetition of VGM should not be completely removed and will continue to exist in the future. Players believe that repetition, especially looping, is an important aesthetic of video games, which has worked in the past and will continue to be implemented in the future. Players believe that current approaches and techniques used with regards to repetition are sufficient, but developers should realise the potential of VGM repetition as a positive phenomenon. Players believe that repetition of VGM remains the most cost effective approach and technique with regards to the time, effort, and financial costs involved with creating, and implementing VGM. Players welcome the functional role repetition has with regards to player feedback via a repeating leitmotif, which becomes familiar to players, and believe that this should continue into the future. However, players believe that repetition could be refined in certain areas where they become overfamiliar with repeating VGM as technology improves.

Bias and Credibility

Let us discuss a little bit of background about the author. Firstly I am a video gamer and have engaged with video games for thirty five years. During this time my favourite aspect of video games has been the VGM. I have appreciated and enjoyed video games, and the VGM that accompanies them, from early abstract 2D games, now called retro games, to modern day 3D games. I have grown up with different kinds of VGM, from looped VGM to symphonic and epic orchestral VGM. I have experienced VGM change from simple systems to complex adaptive/dynamic music systems and beyond. I listen to VGM outside of my engagement with video games in more linear contexts, especially VGM

associated with retro games. I do not perceive looped VGM to be a negative phenomenon in retro games and appreciate its implementation in those genres of video game. However, that does not mean I prefer looped VGM in modern video games. In those genres of video game I expect some form of adaptive/dynamic music system, where the VGM is appropriate to the genre of video game and scenes in the video game. I expect the VGM to provide the player with feedback through the implementation of leitmotifs, which communicate meaning, and as I become familiar with a repeating leitmotif I also use that familiarity as a form of additional feedback. This is where my bias lies.

It was understood that credibility and rigor of the author have an important role in qualitative studies. Credibility can depend on what rigorous methods were used in the study, the credibility of the author, and belief in the value of qualitative inquiry. The author believes that the rigorous methods used in the study methodically and systematically produced high-quality data which was analysed with issues of credibility in mind. The credibility of the author was dependent on my training and experience. The intellectual rigor of the author was reinforced by epoch where rival explanations and disconfirming cases were also discussed where appropriate (Patton, 2002). I had not undertaken a qualitative study before and had to learn what was required since it was the author's responsibility to address issues of credibility. In that context I have done my very best to be as transparent as possible in all the different aspects of the study, from the literature review, through to the methodology, and into the discussion of the findings. I attempted to take responsibility for everything that I learnt was required of me, this included the creation and administration of the questionnaire, participant selection, conducting the interviews, issues with the findings and how the sample impacted findings, developing and explaining patterns from the findings, verifying meaningfulness from the findings, and looking for alternative patterns in the analysis. Ultimately, I believed that qualitative inquiry would add more depth and flexibility to the study because it explained, and added meaning to, the phenomenon of VGM repetition from the player's perspective.

Implications

Theoretical

The biggest theoretical implication for this study is other VGM research. The majority of the previous literature discussed the repetition of VGM as a significant problem which warranted a drastic solution, but there was very little empirical evidence to support this hypothesis (Berndt, 2012; Lendino, 1998; Plans & Morelli, 2012; Wharton & Collins, 2011). When there was empirical evidence, the previous literature explained that players preferred adaptive/dynamic music over looped VGM, but this could have been because players preferred VGM which provided them with feedback rather than players having an issue with VGM repetition (Adam et al., 2014; Chan et al., 2017; Wharton & Collins, 2011).

When the literature discussed the positive implementation of repeating leitmotifs, which provided player feedback due to familiarity, there was very little evidence that confirmed or disconfirmed this (Collins, 2007a; Summers, 2012). This also applied to when a theme, which incorporated a leitmotif, was repeated to add identity, a sense of continuity, and unity to video games, and their franchises (Brame, 2011; Collin, 2007a; Reale, 2011; Whalen, 2004). This study attempted to fill this gap in the literature by providing players' perspectives on how they viewed repetition of VGM in video games.

The second theoretical implication for this study is in video game enjoyment and engagement. Although video game enjoyment was not the only focus of this study, it was understood that VGM impacts video game enjoyment (Boyle et al., 2012; Cassidy & MacDonald, 2010; Mekler et al., 2014; Nacke et al., 2010). Repetition of VGM can have an impact on many different dimensions of enjoyment and this study attempted to understand that relationship better.

Finally the third theoretical implication is for music familiarity research. Although it was understood that repeated exposure to music increases familiarity, which increases liking (Madison & Schiolde, 2017; Peretz et al., 1998; Tavani et al., 2016; Zajonc, 1968), one interesting piece of information emerged about familiarity and VGM. Repeated exposure to a leitmotif increased player feedback as players became more familiar with the repeating leitmotif (Reale, 2011; Summers, 2012). This was perceived as an interesting phenomenon with regards to leitmotifs, repetition, and familiarity, which could be interesting in music familiarity research.

Practical

One of the philosophical and theoretical orientations of this study was pragmatism, and the practical implications of this study reflect this. The first practical implication for this study is VGM artists, composers, and producers that create VGM for video games. The second practical implication for the study is developers that implement VGM into video games. Artists, composers, producers, and developers have used different approaches, and techniques, to reduce, conceal, and remove VGM repetition. This study attempted to remove some of the ambiguity and confusion that surrounds repetition, and through the use of familiar repeating leitmotifs, attempted to show that repetition of VGM can serve an important functional role in video games, which increases engagement.

Limitations

The biggest perceived limitation of this study could be that it is a qualitative study. However, a qualitative approach was undertaken due to the purpose of the study and the audience of the study. A qualitative approach offered more meaning of the phenomenon of VGM repetition, the players being studied, and video game culture. A qualitative approach added more depth, flexibility, and

understanding about the nature of reality with regards to the phenomenon (Burns, 2000 Creswell, 2014; Flick, 2014; Patton, 2002). Also, the author felt more confident with a qualitative approach because they do not possess a scientific background. However, a qualitative approach proved to be more costly with regards to the time and effort required in creating the study.

Another perceived limitation of the study could be the sample size of participants. However, sample accuracy was more important than sample size because accuracy, meaning, and depth were the focus of this study. Information-rich participants were selected because they added greater depth and credibility to the inquiry, and were more important than selecting a bigger sampling size, which was representative of a population, and required statistical analysis. Information-rich participants illuminated and focused the study, added flexibility and emergence to the study, and allowed participants to become involved in, and contribute to, the study. The sampling strategy of purposeful sampling was used because it best fit the purpose and orientation of the study, the time, cost, resources available, and the intellectual rigor of the author (Oppenheim, 2000; Patton, 2002; Peterson, 2000).

The author would have preferred all the participants returned in study 2 to complete the interviews, but it was believed that enough returned to continue the study and provided enough new information. Also, information-rich casual gamers who believed that VGM was important to their video game enjoyment were not interviewed, and could have added to the discussion about repetition of VGM.

Also, because much of the previous literature, which discussed VGM repetition, did so with regards to procedural audio (Adam et al., 2014; Chan et al., 2017; Collins, 2009; Plans & Morelli, 2012) it was disappointing that this was not discussed more with participants. Participants were mainly unaware of such an approach and technique, which made it difficult to discuss it with most participants. In hindsight the author believes that they should have tried harder to discuss it with participants, possibly in study 2 after a rapport had been set up with them, but this was not done because the author did not want to force participants.

Since video game enjoyment is a complex multidimensional concept, it was believed that only the ambiguous term of enjoyment should be used when discussing it with participants. However, this meant that it was difficult to accurately hypothesis what dimensions of enjoyment were discussed in the interpretation of the findings. The author did his best and used his intelligence, experience, and judgement to create coherent, consistent, and solid evidence in support of the findings while considering the audience of the study. The author attempted to question the extent that the findings increased and deepened the understanding of the phenomenon, if the findings were consistent with the previous knowledge, and that the findings were useful for the intended purpose of the study.

Ultimately, because substance significance was used, the author believes that the readers of the study would make their own judgements (Burns, 2000; Creswell, 2014; Flick, 2014; Patton, 2002).

Future Research

Future VGM research could focus on the relationship between leitmotif (and theme), familiarity, and feedback. As with some of the previous theoretical literature, this study found that repeated exposure to a leitmotif, which provides player feedback, becomes familiar to the player, and this familiarity offers an additional layer of feedback to the player (Reale, 2011; Summers, 2012). It could be interesting for future research to understand how this relationship works because repetition in this context has an important functional role in video games, which players seem to benefit from.

Future research should also focus on the use of keeping a familiar leitmotif (and theme) present in procedural audio (Collins, 2009). This study found that players preferred to have some form of familiarity in their VGM even if the VGM was procedurally created. Familiarity with leitmotifs added to their player feedback, it gave video games an identity through familiar iconic themes, it added a sense of continuity to video games through familiar iconic themes, and it gave video game franchises a sense of unity through familiar iconic themes (Brame, 2011; Collins, 2007b; Reale, 2011; Summers, 2012). Participants of this study believed that procedural audio systems could lose this familiarity, which would have a negative impact on the role and function of repeating VGM.

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