CHAPTER 2

Bullet Hell: The Globalized Growth of *Danmaku* Games and the Digital Culture of High Scores and World Records

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In *danmaku* ("bullet hell") games, the player is given control of a small avatar—often a spacecraft—and tasked with avoiding wave upon wave of complex patterns of "bullets" fired from enemy units. These games are most often considered a quintessentially Japanese genre (Crawford 2013; Davison 2013a; McMillan 2013) and an extremely difficult game format which will only appeal to small crowds of players (Donovan 2010; Clearwater 2011; Bailey 2013) who have the requisite skills to meaningfully compete at the highest level. This chapter seeks to challenge these assumptions and puts forward two interrelated arguments: first, that *danmaku* games have been significantly globalized beyond their native Japan, even if Japanese players remain strongly dominant in high-level competition, and secondly that the culture of *danmaku* competition has expanded outside the arcades from whence it originated, and now

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A. Pulos, S.A. Lee (eds.), *Transnational Contexts of Culture, Gender, Class, and Colonialism in Play*, East Asian Popular Culture,
DOI 10.1007/978-3-319-43817-7_2

high-level players from many nations—as well as less-skilled players who play for reasons other than pure competition—now enjoy and engage with the genre. In doing so, the *danmaku* genre has become a more important aspect of global game culture than ever before. The chapter also argues that our present understandings of high-level gaming competition, primarily eSports and speedrunning, are inadequate to fully explain the model of *danmaku* competition created by these above two developments. This form of competition, involving as it now does a greater range of players (in terms of both geography and ability) than ever before, merits an analysis which draws upon, but does not rely upon, previous work on these other forms of competitive, professional and high-level gaming. The later parts of the chapter therefore examine *danmaku* competition in detail.

The chapter has the following structure. It is firstly a historical analysis of the *danmaku* genre, its position within early video game arcade culture and the shift in *danmaku* away from competition in the Japanese physical arcade and towards competition mediated in globalized digital forums and video sharing websites. The chapter is subsequently an analysis of the contemporary state of the *danmaku* genre in regard to world record competition in this genre, the similarities (and differences) between competition in singleplayer games and multiplayer eSports, the epistemological ambiguity in the concept of the "world record" when contrasted with the eSports concept of the "world champion" and questions of collaboration and sportsmanship posed by this particular form of competition. The chapter lastly returns briefly to the question of geography and considers the continuing dominance of Japanese players in *danmaku* games and the role of nationality as a determining factor behind the rise of the most-skilled players in a range of game genres. This analysis will demonstrate that the appeal of *danmaku* games is considerable in both geographical scope and player ability and that high-score competition is a model of competitive gaming which is noteworthy and highly distinctive from others which have been previously analysed in game studies literature. To examine these three factors, the chapter draws upon scholarly examinations of Japanese gaming culture, original research into the online community of *danmaku* players, the author's own experiences as a *danmaku* world record holder and high-level competitor and work on eSports and other forms of competitive gaming. This chapter therefore provides an overview which aims to both serve as a centralized descriptive source of information for future game studies scholars investigating the shmup/*danmaku* genres and the nature and history of arcade gaming more generally and also as an original analysis

of a particular form of extremely high-level video game play and the distinctive cultural, competitive and cooperative norms and expectations which have emerged around it.

Amusement Arcades, Shmups and *Danmaku* Games

From the late 1970s until the middle of the 1980s—a period now referred to as the "golden era of arcade games"—amusement arcades were one of the most well-established and popular ways to experience and play new video games (Davison 2013a). Arcade games were coin-operated ("coin-op"), which meant that a player gaming in an arcade had to pay each time they died or lost a continue. As players must insert coins to keep playing, these games were designed to offer immediate rewards within the first few minutes of play. This was often in the form of early, easy bosses, encouraging players to commit to the game through an early feeling of achievement and mastery. Many arcade games were also structured to take advantage of the coin-op system in other ways; a five-stage game, for example, might make the first four stages comparatively simple or short, whilst the fifth stage is extremely long and extremely challenging, to induce in the player a false sense of having "nearly won" the game and thereby encourage further depositing of coins. A striking example of this mentality is *Metal Slug 3* (2000), a game where the fifth stage is longer than all the previous four stages combined and is also arguably the most challenging stage of the game and also contains a number of "false endings" and bosses which appear to be the "final boss", until they are defeated, and the player learns there is yet more to do. Arcade games also featured another important component: a high-score list (Taylor 2012, 3), where players could generally enter a three-character nickname (such as the author's preferred "MRJ") to represent themselves (this system yields 17576 possible nicknames, a volume of potential nicknames likely sufficient for any arcade). The crucial role played by the arcade high-score list will be returned to later and forms a key component of this chapter's analysis.

One of the most popular genres of arcade games was the "shoot-em-up", or "shmup". Shmups are games where the player is in control of a single unit, normally a spacecraft but sometimes a tank, aircraft or submarine, and is faced with waves of enemies moving towards them and shooting at the player (Bailey 2013). The player shoots their own bullets in return; in some games the player can change the direction of their bullets, whilst in other games, the bullets are only fired forward. The genre is therefore defined by three major actions from the player—"aiming, shooting, and dodging" (GameOne 2009). The first of these games was

arguably *Space Invaders* (Betts 2005; Davison 2013a), which saw waves of enemies descend from the top of the screen and occasionally fire bullets. *Space Invaders* and its derivatives soon gave way to horizontal-scrolling shmups such as *Defender* (1980) and vertical-scrolling shmups such as *Xevious* (1982), in both cases games where a fixed background scrolls underneath the player's ship as the player moves "up" or "across" the terrain. The overwhelming majority of shmups follow this model, and those with horizontal scrolling are generally considered slightly more challenging since it is far harder for a human eye to track the path of a bullet travelling sideways (GameOne 2009) than from the top of the screen to the bottom. In the early 1990s, the subgenre of *danmaku* (which roughly translates as "bullet curtain") emerged and quickly became a staple in Japanese arcades. Although there is slight ambiguity in all subgenre definitions (Clearwater 2011), *danmaku* games are generally agreed to be shmups defined by the overwhelming number of bullets fired at the player (Ng 2005; GameOne 2009; Crawford 2013), the often highly complex geometric patterns these bullets etch out (McMillan 2010, 273; Bailey 2013) and a requirement for extremely fast reaction times from players (Clearwater 2011). These appear to be important requirements for defining the difference between a "shmup" and a "danmaku". A crucial component of *danmaku* games is that the player's "hitbox"—the part of the player's spacecraft which can actually take damage—is extremely small (Ng 2005; GameOne 2009; Davison 2013a), meaning that a far greater volume of bullets can be visible on screen at once whilst still making it possible for a player to avoid them. In some games the location of the hitbox is explicit and obvious—many *DoDonPachi* games contain a flashing circle at whose core lies the few pixels where the player can be hit, as do many others—whilst in some games it is less clear, and the player needs to learn which part of the ship sprite is the part which will actually take damage and which parts bullets will go "through" without issue.

The basic mechanics of all shmups and their *danmaku* subgenre are therefore extremely simple and easily picked up in an arcade environment—move, and shoot (Hock-koon 2012, 5)—and offer an immediate ease of comprehension for any player (Crawford 2013; cf. Taylor 2012, 29). However, once the genre had become established—arguably (Davison 2013a) via the game *Batsugun* (1993), whose first boss introduced a hail of bullets on a scale never before witnessed by players—*danmaku* games quickly became more and more challenging as game designers competed to see "how many projectiles they could get on the screen at one time" (Crawford 2013). Fewer and fewer players were subsequently able to com-

plete these games, although the most-skilled players relished these new challenges (GameOne 2009; Donovan 2010, 97). *Danmaku* are therefore "staggeringly difficult" (Bailey 2013) games which "test [a player's] gaming abilities to the absolute limit" (Davison 2013b) and appeal to "hardcore" gamers—those who enjoy deep and complex gameplay (Novak 2005) and are highly skilled in the act of playing computer games (Dena 2008)—whilst still always maintaining the chance of eventual player victory: as one interviewee in the French TV channel GameOne's documentary on shmups put it—"when a *danmaku* is well done, there is *always* a way to survive" (GameOne 2009, emphasis mine).

Danmaku games are therefore extremely difficult to master—there is a "quantum leap" between *completing* one and achieving a "decent high score" (Hock-koon 2012, 5)—especially when coupled with the potentially intricate scoring systems which all *danmaku* games possess (McMillan 2013), tracked on the high-score list for each instance of the game. These scoring systems can be divided into three major categories (Betts 2005), although some games use more than one of these in conjunction. The first is *chaining*—this is a score system where the player builds up a "chain" by destroying certain enemies in a certain order, and the more enemies the player kills according to whatever rules the game possesses for chaining, the higher their score. Examples might be destroying enemies of the same colour (e.g., *Ikaruga* (2001)) or destroying enemies within a few seconds of each other, making sure to be quick enough with each subsequent kill that the chain is not "dropped"—for example, *Ketsui* (2003). This system promotes a high level of memorization and strategizing to identify the best possible way to chain the finite number of enemies which will spawn. The second is *collection*—this is a score system where enemies drop items or "tokens" which the player can collect, and the player's score is in some way based on the collection of these tokens (how many are collected, or which tokens are collected, or what sequence tokens are collected in, or different tokens affect different score multipliers)—examples would be *Mushihimesama Futari* (*2006*) and *Triggerheart Exelica* (2006). The third is *proximity*—this scoring method can take two possible forms. The player either gains more points the closer to an enemy the player's ship is when the enemy is destroyed or the player gains points for "grazing" enemy bullets, which is to say making sure that bullets run extremely close to the player without killing them, rather than choosing "safer" paths which take the player's ship far away from enemy fire. *Proximity* is therefore a risk/reward score mechanic in both its forms, where the greater risk of proximity to enemies or their bullets yields greater rewards. Examples are *Ketsui*

(2003) and *Blue Wish Resurrection* (2006). As *danmaku* games became more popular in Japanese arcades, it quickly became apparent that players were willing to practice to master both these complex scoring systems and the challenging game mechanics in pursuit of a coveted high score (McMillan 2010, 183) and the recognition and mastery that came with it.

From Japan to the West

Although these impressive high scores were once limited to Japanese arcades, players from all over the world now hold records in the *danmaku* genre. To understand how these games found their way into the West and into the current global competition we now see, we must first examine arcade gaming in the era before the emergence of the *danmaku* subgenre. Arcade use within Japan has always been a primary medium for playing games (Aoyama and Izushi 2003; Colwell and Kato 2005), and Japan remains the only country which has maintained an active, vibrant and profitable arcade culture into the present day (McMillan 2010, 368). Arcades were ubiquitous in Japan in the era of *Space Invaders*, and *Space Invaders* could in turn be found in a range of other non-arcade settings where brief amusements or distractions might be appropriate (GameOne 2009)—there were even specialized establishments, "Invader Houses", where only *Space Invaders* could be played (Crawford 2013). Following the success of *Space Invaders*, shmups and their *danmaku* descendents quickly became extremely popular in Japanese arcades (Crawford 2013; Davison 2013a). In the past decades, there were even shmup and *danmaku* tournaments in Japan—these might contain elimination heats and then a final competition between attendees, often in the form of a "Time Attack" mode: a contest to see who can accrue the most points in a two- or five-minute period (GameOne 2009). Although other games with extremely high skill ceilings were introduced to the Japanese arcades as time went by—such as fighting and rhythm games (Crawford 2013)—shmups still retained an important place in the arcade repertoire.

When shmups and *danmaku* games eventually began to expand outside this Japanese context, this change was characterized by two major trends: firstly, the shift of these games away from arcade cabinets and towards home consoles and personal computers when shmup developers began to release their work on these platforms and, secondly, a concurrent shift of high-score competition away from arcade high-score lists and towards a globally mediated community of skilled players. It is difficult to place an exact

date on the shift away from arcade machine—Japanese *danmaku* arcade games trickled into the West beforehand, and there were always dedicated collectors who would be willing to purchase Japanese-region machines in order to play these games outside Japan, although Western arcades were generally devoid of *danmaku* games (McMillan 2010, 368)—but the game which exemplified this move was arguably *Ikaruga* (2001), released worldwide on the GameCube. *Ikaruga* introduced many Westerners to the genre for the first time (Davison 2013a, b) and has been re-released many times on multiple console platforms and demonstrated the viability of the shmup/*danmaku* market outside Japan. Further exploiting this new and perhaps unexpected market, a range of *danmaku* games produced by Japanese games company *Cave—Ketsui* (2003), *Espgaluda II* (2005), *Mushihimesama Futari* (2006), *Deathsmiles* (2007) and *DoDonPachi DaiFukkatsu* (2008), to name but a few—can now be found on the Xbox 360, whilst a number of Western-made *danmaku* games aiming to mirror the work of the Japanese masters, *Jamestown* (2011), *Shogun: Rise of the Renegade* (2012) and *Danmaku Unlimited 2* (2014), have been released on online game platform Steam and sometimes also on mobile phones (Davison 2013a), alongside a small number of Japanese independent *danmaku* games like *Crimzon Clover* (2011) which are sold online rather than distributed to arcades.

As *danmaku* games have expanded into the rest of the world, the competition for high scores has undergone a coterminous shift in structure and player expectations—the competition has shifted from the physical into the digital. No longer is it the norm to strive for the highest score in your local arcade—and possibly, in some instances, to discuss with players from other popular arcades or visit other arcades to see which machines held the highest scores—but instead to strive for the highest score in the world (although highest arcade and highest global scores were often the same thing in the past and in some cases are still so today). This shift means the methods by which records are viewed and disseminated have also changed. *Danmaku* records and particularly noteworthy playthroughs in Japan have always been recorded and distributed via commercial DVDs (Crawford 2013)—and before that, VHS tapes (Clearwater 2011) and photographs (Taylor 2012, 6)—showing expert players handling particularly challenging levels of some of the most well-played shmups and discussing the strategies they use (Betts 2005). Such videos represent a "staged performance of competitive rivalry, involving skilled players and their narratives" (Seo and Jung 2014, 12). The propagation of these media speaks to what Reeves et al. call the "visceral

pleasure" (Reeves et al. 2009, 210) of the construction of a sequence of highly skilled *danmaku* play, demonstrating it to one's co-players and in turn being one of those co-players consuming and appreciating the skill of another. In the last decade, however, an expectation of submitting scores to fan-operated websites has become an increasingly important part of the shmup/*danmaku* communities, especially for anyone competing in the genre at a high level, and these discussion forums and video services have begun to take over some of the roles of older arcade high-score lists (now that *danmaku* is no longer unique to Japan).

Despite this growth of *danmaku* games beyond Japan and the increasing importance of online recognition, there is no one centralized online repository for *danmaku* records and videos. The most well-known forum and score repository is the *System 11* forum, which contains a number of subforums—*Shmups Chat*, *Hi Scores*, *Strategy*, *Reviews*, *Development*, *Hardware* and *Shmupmeets* (for real-world meetings of shmup players)—and a highly active community[1]. The running of these websites, and the management of records and videos, is carried out entirely by grassroots enthusiasts, as it is with many other competitive games (Rambusch et al. 2007, 161). These environments are digital archives where players upload their highest scores and discuss strategies for maximizing scores, both (as we shall explore in more depth later in this chapter) cooperating and competing with their fellow players to push the records ever higher. They also serve as a centralized repository of video links. Videos are just as important as scores; whereas in the past videos were distributed in physical copy as above, now many videos are uploaded to video sharing sites (although DVD circulation remains in Japan). Gamers of all genres and subcultures often post their exploits on YouTube and other video sharing sites (Witkowski 2013), a trend which has now been carried over into the *danmaku* community. The *danmaku* community has therefore geographically expanded, become partly virtualized and overseen a greater distribution of world records, although there remains no universal repository for the storage of, or agreed-upon method for the submission and management of, records and scores.

Having explored the origins and growth of this community and the circulation of impressive playthroughs and world records, the next part of the chapter will now delve into more detail about the nature of these world records and how we might best analytically conceptualize these *danmaku* world records in relation to our contemporary understandings of professional and high-level gaming.

High Scores, eSports and Speedrunning

There are currently two dominant forms of high-level video game competition which have been given attention by scholars. A very significant body of work has emerged around "professional gaming", now more commonly known as "eSports" (e.g., Witkowski 2009; Rambusch 2011; Taylor 2012; Ferrari 2013; Woodcock & Johnson, Forthcoming), which has deepened our understanding of competition in "multiplayer" games. This is complemented with work examining the community of "speedrunning" (Franklin 2009; Menotti 2014; Scully-Blaker 2014) has explored high-level competition in "singleplayer" games. This section will examine in detail the nature of *danmaku* records and propose an analytic framework for understanding this form of competition. This will be achieved via first exploring the contrasts and comparisons we can draw with both eSports and speedrunning, before drawing on both for the theoretical grounding needed to understand *danmaku* competition, and examining the resulting epistemological uncertainty of the concept of the "world record".

High Scores as eSports?

eSports is a term used to describe organized and sponsored competition in multiplayer games—first-person shooters (FPS), real-time strategy games (RTS), multiplayer online battle arenas (MOBA) and fighting games—where players directly compete against one another in zero-sum games, and the final result always "reveal[s] clear winners and losers" (Witkowski 2013, 161). Competition is directly against other players in the same game instance, not specific stages or levels in the game, and as such, competition in eSports is structured in the form of tournaments where competitors (winners and losers from previous matches in the tournament) are pitched against one another. Such a form of competition means there are multiple winners and losers throughout the tournament in any given match (qualifiers, quarterfinals, semifinals and finals), but only one eventual "winner" emerges to take the title of the "champion".

In this regard we see a potential similarity to *danmaku* competition—in eSports only one player or team "wins" the tournament, even if individual matches along the way may be won by others. In *danmaku* games we could readily compare this to defeating individual bosses or levels which many players can achieve, or beating one's personal best scores, whilst still knowing that there is ultimately only one "overall" winner at a given time: the player

who holds the world record. However, the problem with applying this to *danmaku* games is the concept of the *champion*. The champion (either an individual or team) is essential to eSports—David Sirlin's "competitive gamer's bible" (Sirlin 2006) is subtitled *Becoming the Champion*, whilst a range of other works (Rambusch 2011; Seo and Jung 2014, 2) either implicitly or explicitly assumes a *champion*-based epistemology for defining the most-skilled players or teams who emerge at the apex of a tournament structure. Similarly, many tournaments compete to define themselves as the "world *championship* of computer games" (Rambusch et al. 2007, 162, my emphasis). The concept of the champion therefore appears integrally tied to *tournaments*, which—excluding extremely rare historical *danmaku* tournaments which only crowned champions within the context of that tournament, not in the context of the *game as a whole*—does not apply to *danmaku* games. The model of eSports therefore has some value to our understanding of *danmaku* records because it allows for both interim and lesser victory and a single eventual victor, but a champion exists within a specific tournament in a specific *time* and *place*, not the gradual competition over many years (and in many different homes and arcades) indicative of the pursuit of high scores. This partly helps us conceptualize the world record, but is clearly incomplete and not entirely transferrable from eSports to *danmaku*.

However, there is something else valuable we can take from eSports: the importance of physical competence and skill and the attendant comparison with "physical sports" (Wagner 2007; Seo and Jung 2014, 8). Although scholars in sports studies tend to "police" the definition of the term "sport" (Ferrari 2013, 1) and the debate over the comparison between competitive gaming and physical sports is beyond the scope of this chapter (cf. Wagner 2006; Witkowski 2009; Taylor 2012), it is worth repeating an oft-noted observation. By a standard definition of sport—for example, that by Boxill (2003, 2–3), who suggests that sport must be a freely chosen activity, governed by rules, be *physically challenging* and involve competition—all of these apply ready to competitive gaming. Focusing on the third of those requirements, the physical challenge, shows us the ready translatability of this definition of sport into competitive gaming (Taylor 2012, 37): a player must be able to carry out "layer upon layer of physically demanding action in order to be competitive" (Witkowski 2012, 369) in any challenging game, *danmaku* included. Performing these actions well and reliably requires what Witkowski (2009) calls *training* and Ferrari (2013, 5) calls *drilling*, which in *danmaku* games primarily means practicing a player's pattern recognition and memorization abilities (McMillan 2010, 275).

At the same time, like many competitive games, *danmaku* games do not only reward this kind of "static spatial knowledge" (Reeves et al. 2009, 207), but rather the ability to immediately respond and react to the bullet patterns the player is faced with (whilst many *danmaku* patterns are fixed, many are also quasi-random). Navigating expected patterns and reacting to unexpected ones are therefore both embodied physical abilities (Taylor 2012, 59) very distinct from scoring optimization; these types of actions are emphasized in the eSports literature and have obvious applicability to the acquisition of *danmaku* world records as well.

High Scores and Speedrunning?

We can see that eSports literature acknowledges the physical dimension of gaming skill—essential to *danmaku* games—but it is clear that *danmaku* competition is nevertheless distinct from eSports, due to the lack of organizing bodies and tournaments, the indirect nature of this competition and the problematic concept of the *champion* which does not seem to fully translate into *danmaku* competition. Speedrunning—another competitive community based around singleplayer games and (like *danmaku*) the concept of the "world record" (rather than the "world champion")—may be more illustrative. Speedrunning is the act of completing a game as rapidly as possible (Franklin 2009; Menotti 2014) and is therefore an "extraofficial form of competition" (Menotti 2014, 82) never planned for in game development. The speedrunning community uses the concept of the *world record* (Scully-Blaker 2014) rather than that of the *champion* as in eSports. The shortest proven completion time for a given game in a given category is understood as the record, just as the highest *danmaku* score in a given game is categorized as the record; similarly, speedrunning does not involve a direct competition against opponents in the same physical room or the same virtual game lobby as the player, but rather records may be pursued at any time and place (as with *danmaku*).

However, there is a major difference between the community of speedrunners and the community of *danmaku* players: in most speedrunning competitions—except those which pursue what Scully-Blaker (2014) terms "finesse runs"—glitches, bugs and in-game exploits are all "allowed" in the pursuit of the shortest time (Franklin 2009; Menotti 2014, 86). The *Legend of Zelda: The Ocarina of Time*, for example, can be completed in under 20 minutes by using a significant glitch which warps the player from the chamber of the game's first boss to outside the chamber of the game's

last boss, instantly. Using this glitch (and all other glitches) is considered entirely acceptable—each time a new glitch is uncovered, therefore, it becomes possible to beat the previous world record not through superior *physical ability* nor *strategic planning* but by using a new glitch; this means that the goalposts of *what is considered a record*, and what in-game possibilities exist for a player pursuing a record, change every time a new glitch is uncovered. By contrast, *danmaku* games' goalposts remain stationary; bugs, exploits and glitches are not allowed by the player community, meaning that from the day the game is released until the game where the last person interested in competing for the record gives up, the goalposts are one and the same: the highest score, using the game's established rules and scoring system. We can see this reflected in some speedrunning games where there are multiple world records, using different "rulesets" based on which glitches are allowed and which are not (Scully-Blaker 2014); by contrast, any *danmaku* game with different record categories will have those categories hard-coded into the game (e.g., different difficulty levels, different stages) rather than created by the fan community (cf. Taylor 2012, 54) as a response to growing knowledge about the game's systems (i.e., different glitches are un/acceptable). Considering speedrunning allows us to see that these, like *danmaku*, are competitions in singleplayer games with no need for physical proximity or *direct* competition between players, but the nature of a record shifts constantly as new glitches are found—and *danmaku* is an "official" competition written into the game, not a community-created form of competition—meaning that (like eSports) speedrunning is also not a perfect framework for understanding high-score world records.

The Epistemology of the World Record

High-score competition, therefore, appears to be something distinct. We can see there is similarity to eSports in *danmaku* competition in the extremely high levels of physical skill (and the acknowledgement of interim "victories" which build to an eventual "victory")—but *danmaku* competition lacks the official governing bodies and does not, for the most part, use a concept of a "world champion". Alternatively, if we consider speedrunning, we can see a similarity in the pursuit of high-level competition in a *singleplayer* game, but glitches are allowed in speedrunning whilst they are never valid in *danmaku* competition, and whilst speedrunning is an extraofficial form of competition, high-score lists have been a part of *danmaku* games since *Space Invaders*.

To fully understand the nature of a world record, we should return to the discussion earlier in the chapter of score forums, DVDs and arcade high scores: these are all submitted, and created, by *players* (cf. Taylor 2012, 228–229), not a body associated with the game which manages scores and records nor a system programmed into *danmaku* games which automatically updates a score list on a server (a very small number of modern PC *danmaku* games do possess this functionality, although such systems are not always reliable and cheat-proof). The lack of automatic recognition of victory—of the sort one would get from playing an eSports game in a public league or tournament system—and the requirement for "proof" lead to a level of epistemological ambiguity in the definition of the "world record" (for both *danmaku* and speedrunning). To take an example, the game *Warning Forever* (2001), a very unusual *danmaku* game which eschews the traditional level-boss structure for a game composed entirely of bosses designed by the game's AI in response to the player's actions, supposedly has a world record of around 96 million points. Although a number of people claim to have seen this video, the only previously extant copy (from back when forum members discussed the record) is no longer available from its original source, and the author has been unable to identify another copy of this record on any video sharing site or to get in touch with the player who supposedly achieved this record. The best that can be identified is 70 million (still an extremely impressive score), currently available for all to watch on YouTube. Therefore, is 96 million still the world record? Naturally a record in any competitive endeavour can go "backwards" if it becomes clear that a new record was earned dishonestly, in which case the previous record once more becomes "the record", but what if all evidence of a world record is *lost*? To consider this in terms of physical sports, we might equally ask: if someone beat the 100m sprint record, but then all visual records of that achievement were lost, would we still consider that to be the world record, when we only have the statements of those who saw it to go on? This is difficult to answer, and naturally the analogy is not perfect (physical sports have larger numbers of people interested in them, and therefore we could reasonably assume a larger number of people would have witnessed the achievement), but it is nevertheless an illustrative comparison about this unusual question. The establishment of any kind of *record* in any competitive endeavour is according to community norms: communities of competition implicitly ask the question "what is sufficient proof of a record?" (whilst eSports communities ask "what must a player do to be crowned champion?"), and over time an answer to

that question emerges, which in the *danmaku* community means a video (for less-played games, a screenshot will sometimes suffice, but for games where the competition is fierce, a full video is essential proof). Without a video—is that still the record?

Simply put, players differ: once again highlighting the lack of any central or official coordination for these issues and the distributed nature of *danmaku* play. Some *danmaku* players would say that the previous record remains the record, but many would not, and thus acknowledging the inherent uncertainty and ambiguity in a world record appears to be an integral part of such a conception. World records in *danmaku* games are the site of fierce competition, but that competition is community-managed and player-led—a bottom-up approach, rather than a top-down one—and this leads to the possibility of uncertainty, debate and competing claims to a single title. A world champion is defined, and whoever meets that definition is crowned; a world record is something ever-changing and is only defined in *relative terms* to previous scores. We can therefore see that the concept of a *danmaku* world *record* now exists in a discursive space defined by what videos and "proofs" have been submitted (and how believable/reliable these are deemed to be by an unofficial jury of peers) rather than relying on the cultural milieu of the arcade, whilst a world *champion* appears to require the existence of a structured competition designed to define who possesses such a status. In turn, although the score-keeping system in *danmaku* games is structured by game designers, the competition is not, being grassroots. We can therefore appreciate a spectrum: eSports games most often have both the method of keeping score and the structure of the competition coded into the game, *danmaku* games have a hard-coded method for keeping score but the competition remains grassroots, whilst speedruns look to the grassroots community for both. Newly global *danmaku* games therefore exist somewhere in the space between the two, resulting in a competitive situation which is highly distinctive.

Cooperation, Competition and Sportsmanship

As we have seen in the above section, *danmaku* game world record competition exists in the space between our understandings of eSports and speedrunning, although it appears significantly closer to the latter than the former. Having explored this nature of world records, *danmaku* competition and the frameworks, we might use to understand them—acknowledging the

inevitable vagueness that competitor-reported world records bring with them—this chapter will now explore some of the intriguing impacts and aspects of *danmaku* competition, which cannot be fully articulated if relying solely upon work on eSports nor speedrunning. These impacts fall into two categories: the interplay between cooperation and competition and the lack of sportsmanship in *danmaku* competition. Examining these two factors will strengthen our understanding of this competition and the community of players involved in it, and further the body of game studies work into the highest levels of competitive gaming.

Let us begin with the first of these—the interplay between cooperation and competition—in order to further understand the experience of being a *danmaku* competitor and the cultural norms one is expected to adhere to. Earlier in this chapter, we discussed the sharing of strategies via the videos of high-level *danmaku* play released to the public, and it is to this point we now return. In eSports, competing teams or individuals would never exchange information about the game, and in some cases top players have been known to "hold back" new tactics or moves in preparation for an important tournament, to then unleash them on unsuspecting opponents (Taylor 2012, 95). In speedrunning, however, it is expected that all players will work together on deducing the best strategy for the game (given current knowledge of glitches and exploits). Players *cooperate* in their theorycrafting—the analysis of game mechanics designed to optimize and improve player decisions and strategies (Wenz 2013)—and then *compete* to be the player with the best possible reflexes and execution ability (cf. Witkowski 2009) who can carry out these strategies in the game itself. Now that *danmaku* games are the dominant subgenre of shmup, the "skill level required to play [these games] has become daunting" (Crawford 2013), and thus collaborating on the strategic level reduces the pressure and the requirement on any given player to master strategy, as well as mastering execution. All players therefore benefit from this shared knowledge (cf. Boxill 2003, 108).

There is an interesting contrast with physical sports here. Boxill (Ibid, 5) notes that each player in a physical sport "must develop strategies to counter a competitor's skills and strategies"; by contrast, we have seen that for *danmaku* games (and speedruns), the strategizing aspect is a generally collaborative endeavour, even between opposing players who will later compete for a world record. One must only develop skills to outmatch the skills of all opponents (McMillan 2010, 370–371), not strategies to counter an opponent's strategies (since all high-level players are assumed

to be attempting to execute, in essence, the same optimal strategies). And if one player does create an entirely new strategy and intentionally does not share it with the world, as soon as they achieve a world record with that strategy and upload the video, the strategy becomes public knowledge, and the competition thereby once more becomes about the skill of execution rather than the quality of the (now public) strategy. This means a player "debuting" a new strategy will want to get the best score possible with that strategy—since the act of releasing the strategy "elevates" the ability of all other players—and from this point, it is extremely interesting to examine the role of "sportsmanship" in *danmaku* competition.

Sportsmanship is a contested term, although it is generally agreed to mean some combination of fairness, ethics and generosity in competition (e.g., Keating 1964; Boxill 2003; De Koven 2013). One proposal of what sportsmanship should entail is a particular scenario known as the "anti-blowout" (AB) thesis. Dixon (2003, 84) describes the AB thesis thus: if a particular game appears to be turning into a "blowout", meaning a game where one team is obviously going to achieve an immense and potentially humiliating margin of victory over the other team, the clearly dominant team or player should pull back and stop trying their best to maximize the margin of victory "in a one-sided contest". Feezell (2003, 99) argues in support of the AB thesis, proposing that continuing to rack up points after victory is obvious "fails to respect "true" or "real" competition", because such competition "requires being challenged or tested by worthy opponents". It is this defense of the AB thesis which is interesting to explore: in a *danmaku* context, it could reasonably be take to mean that one should not achieve an unnecessarily high score, because that implies one was not battling worthy opponents, but rather that one should only achieve a score necessary to secure victory.

To see why this is inappropriate and how *danmaku* is therefore distinct and noteworthy, consider two competitive matches of physical sports, where two teams or two individuals are directly pitted against one another. A score of 2-1 in one match has no relevance to a score of 10-1 in another; one cannot say with certainty that the team that scored ten points in the second match would have defeated the team that scored only two points the first match, for those matches are both entirely different contexts, and one cannot assume the two losing teams are equally skilled (or unskilled) despite each achieving but a single point. However, in *danmaku* high-score competitions, one *can* make judgements of this sort: each score stands on its own, and therefore every single score can be meaningfully

compared to every other score, for they all fight against the same in-game foes, levels, scoring systems and bosses. We can therefore see that the AB thesis is in essence only relevant to what those of us in game studies would consider player-versus-player (PvP) competition, such as that found in eSports—both or all players are competing within a given match, and there will always be a winner and a loser from that immediate contest. It does not apply to *danmaku* (or speedrunning).

We can therefore identify the competition for high scores as being what McMillan (2010) calls "indirect PvP", but which I believe is better exemplified by what I shall term *asymptotic competition*. Players are not competing against each other (Crawford 2013) to achieve the highest score in a given day or week, for example, and nor are they competing within the same instance of the game at the same time and trying to defeat bosses faster than each other, or clear the entire game before their opponent. A skilled player therefore *does* want to maximize the margin of victory, for the higher that margin is, the trickier it will be for any subsequent player to come along and trump it. Equally, almost all *danmaku* games are finite (Bailey 2013) and will therefore have a "maximum possible score"—no world records are "perfect" in that regard, but if we alternatively consider the competition for world records as a competition to get closer and closer to the "perfect game", where every useful pickup is collected, and every enemy defeated, in a perfect order which maximizes the scoring mechanics of a given game, we could see this as the pursuit of *excellence* (cf. Witkowski 2013), rather than the pursuit of *victory*. It is the pursuit of an ideal perfect playthrough of *Ikaruga* (or whatever other game), and each time a new record is achieved, human achievement moves closer and closer to that ideal. There is always a "winner" at any given time, but in many cases this is a temporary winner until a superior playthrough is achieved. I therefore select the term *asymptotic* to describe this kind of competition: just as in mathematics an asymptotic curve approaches a line but never reaches it, in *danmaku* high-score competition scores approach the perfect game but never achieves true perfection (such a playthrough would require constant pixel-perfect and frame-perfect movements and inputs for upwards of half an hour, which is immeasurably beyond the skill of any human game player). Such competition is better understood as being more akin to individual sports—running, jumping, swimming—than team sports and is therefore significantly closer to the concept of speedrunning than the concept of eSports; all competitors "cooperate" in order to identify and comprehend the scoring systems in the *danmaku*

game in question and to exchange strategies, and the competition rests on who has the technical skills to execute the riskiest but more rewarding maneuvers and carry out the most optimal scoring path through the game. Whilst this might seem like a fundamentally modern form of competition enabled and mediated through the internet, this is effectively the model of competition used in track-and-field events throughout the ages (especially since the inventions of photography and video)—there may be sometimes competitions constrained to within a single day or event, but it is the wider global competitions which concern the highest-level competitors and the attempts to reach ever more impressive physical feats and world firsts. Asymptotic competition exists both against the game or the physical task itself, which must be mastered and improved, and against all those who are attempting the same.

Therefore, crucially, in a *danmaku* game, one is not just attempting to defeat opponents in the present—both those present in the game world and the world record—but also to preemptively defeat opponents in the future. The higher a score a player attains, and the more distant that is from the prior world record, the more challenging we can reasonably assume it will be for anyone else to subsequently seize the world record. We can therefore understand all competition in *danmaku* games as being asynchronous, both in terms of players competing at different times and having no knowledge of each other (until a new record is achieved), but this asynchronicity also extends into the future, for each new world record exists with an *implicit assumption of future competition*, and therefore the higher any given record, the longer it is likely to stand for. This is, of course, the same model as individual athletics holds to, although as noted above, these are still primarily raced against others in the specific context of a given competition, giving a level of temporal specificity to when (and a spatial consistency to where) competition is carried out, unlike the spatially and temporally distributed competition of *danmaku* games. This is therefore a development of McMillan's (2010, 184) important concept of "indirect PvP", but modelling this as asymptotic competition acknowledges both the striving towards a potential "perfect game" as well as against other players and the projection into the *future* which necessitates maximizing your best possible score, as well the comparison with *older* high scores distinctive to indirect PvP. To return to the earlier arguments in this chapter, this has become even more relevant to the *danmaku* community now that competition is spread globally and virtually, rather than physically and confined to Japan. Asynchronous competition

is simpler when the games can be played from one's home rather than in an arcade and when scores can be immediately updated and uploaded online rather than having to check in with scores obtained at other physical arcade venues.

The "Winner" and the Million Losers

We have now identified that *danmaku* games are focused for many players on a spaciotemporally distributed form of competition towards the highest possible score; that the pursuit of a high score rather than victory within the delineated space of a tournament venue leads to asymptotic competition, which sees players competing for every greater individual feats within a given competition no matter when or where these feats are accomplished; and that this means traditional concepts of "sportsmanship" do not readily apply, and engaging in such practice would only reduce one's ability to compete at a high level. However, one question still remains, in this case about the role of all the players who are, simultaneously, not the world record holder. If there is only one world record holder at any given time, who—due to the irrelevance of traditional notions of sportsmanship in this context—seeks to optimize their score to the greatest extent possible, what can be said of the other players? Is every other player (as we saw earlier in this chapter, there are more such players these days than ever before) who competes at *danmaku* games but doesn't earn the world record a "loser", whilst the player with the record is the only "winner"? And what, as Witkowski (2013, 161) asks, does an overt focus on *winning* as the sole drive for gameplay do for the experiences and cultures or those engaged in such practice? This section will explore these questions to conclude our understanding of the particular form of competition offered by (and culturally created around) *danmaku* games, arguing that despite the clear focus on winning, winning does not mean the same to all players, and *danmaku* games are often structured in a way to engage lower-skilled players in ways which do not necessary draw recourse to those competing at the highest level in the same games.

Firstly, we must acknowledge that many players compete against their own personal bests rather than the global bests when playing (Crawford 2013). There is still a vast range of possible skills and achievements which are not at world record level: beating a *danmaku* game, beating it on higher difficulties, beating it without using a continue and maximizing one's personal score. When a player "loses"—which is to say they lose

their last life, their score is tallied up and the game ends—a player generally perceives themselves as having lost to a certain *challenge* in the game, not the abstract score of the world record. This might be a particular boss, or a particular level, or a particularly challenging enemy. There is generally no built-in player-versus-player system in *danmaku* games but rather in-game challenges which push the player to improve their skill solely in the context of their own ability, whether or not this subsequently expands to improving their skill in the context of other globally dispersed players of the same game. Victory is seen as victory over those same in-game challenges, which are victories the game will track on a "personal" high-score list; only high-level players understand victory as relative to the scores achieved by other players and the global high-score list, and even then, one would not feel that one had been "defeated" by the record holder if a player loses their last life and has to restart the game. Even if competing for the record, an unsuccessful record attempt still feels as if one has simply *not yet beaten* the current record holder, rather than feeling a sense of defeat at the hands of the record holder. This brings us once more to asymptotic competition, showing that feelings of victory or defeat are therefore not resigned to a specific spatial or temporal moments and that competition can take place at any place and time. Such a model is somewhat distinct from individual sport competitions: most of those take place in situations (e.g., the Olympics) where there are multiple individuals in a single arena competing for the same record (although such competitions also take place in less formalized contexts as well). Such a real-world meeting is extremely rare in *danmaku* games; most often the record is something ontologically "out there" and a given player knows nothing of anyone else competing for it at a given time (and the current record holder will presumably have no idea that another specific player is competing until that unknown player beats their record).

There are also other interim benefits for non-world-class players which suggest that winning and losing in *danmaku* are not clear cut. The seemingly impossible mass of bullets on the screen, once found to be navigable, yields a significant sense of achievement and mastery (GameOne 2009); in turn, this supports McMillan's claim (McMillan 2010, 413) that a more daunting game makes players feel less upset when they are unskilled, as they can rationalize the perceived difficulty of the game from what they see on screen. We can therefore suggest that *danmaku* games are able to simultaneously offer significant subjective rewards to skilled players whilst also giving less-skilled players a "get-out clause" to excuse comparatively

low achievements. This is also particularly important when we consider the length of time and effort it takes any player to reach the highest levels of play. A top Japanese *danmaku* player once estimated that finishing the highest difficulty of one of the *DoDonPachi* games would take a new player four hours a day for a period of *ten years* (Kemps 2011, 166), a striking account of the "routinized performances of the practice" of game-playing (Seo and Jung 2014, 9) necessary to compete at the highest levels. As one Japanese *danmaku* player in Crawford's (2013) documentary *100 Yen: The Japanese Arcade Experience* puts it: "it's not fun—it's our life to be the best". This cannot be seen to apply to all *danmaku* players, however, and relegating everyone except the record holder to the status of a "loser" in the game seems indefensible; a more nuanced understanding is that only the best players consider "winning" and "losing" in terms of the world record, whilst all other players hold different (but no more or less valid) alternate metrics for defining their successes and their failures. This is not to suggest that lower-level players do not engage with the world records at all, for many watch world record videos for their aesthetic and visual qualities rather than to educate themselves on strategy, but rather that there is a correlation nevertheless present between player skill and player understanding of the higher levels of interpersonal competition. The question of the world record still suffuses all *danmaku* games as it perhaps must suffuse any game with a score counter, but is only directly and immediately relevant to the gameplay of a smaller group of highly skilled competitors.

In order to now come full-circle back to the chapter's first exploration of *danmaku* in the Japanese context, an obvious question presents itself: has the skill at *danmaku* games spread out into the rest of the world along with interest in this genre? In a word, the answer to this question is no. Despite the expansion of the genre into the West in the last decade or two, a large percentage of all records (perhaps as high as 90%, although the previously mentioned epistemological ambiguity over some records makes it challenging to make this number exact) remain held by Japanese players, and only a small number of *danmaku* games have their records held by non-Japanese competitors. Four such records are held by the author (who is based in Europe); a number are held by several other strong Western players (primarily from North America); but that is where it ends. It is also worth noting that few of these non-Japanese records are held in the most well-known games; all Western records the author has been able to identify (including his own) are for *danmaku* games in the "second tier" of the

genre—with large playerbases and extremely high levels of competition, but not necessarily the required near-perfection of records in, for example, the *DoDonPachi* or *Mushihimesama* series of games. This is comparable to an observation from Rambusch et al. (2007, 162) in their examination of *Counter-Strike*, noting that it is not sufficient to merely be a top *CS* player but that one also has "to play in a good team that *wins tournaments*" (emphases mine)—or, in this case, to earn records in the most noteworthy games. The glory of winning "shines brighter in proportion to the magnitude of the challenge" (Smith 2004, 38), and whilst every *danmaku* record is a feat which requires overcoming the immense challenge of these games discussed earlier in this chapter (Bailey 2013; Davison 2013b), not all records or tournaments (in all fields, not just gaming) are created equal. The extent to which the highest level of skill will globalize to the same extent as the games themselves therefore remains to be seen.

Conclusion

This chapter has examined *danmaku* games and advanced several interrelated arguments. It firstly argued for several connected shifts in the genre in recent years—from a Japanese genre to a world genre (albeit one where dominant players still remain in Japan), from a genre played in physical arcades to one played primarily in the home, and from a model of record keeping based on arcade high-score lists towards record keeping which emphasizes online repositories of scores and their attendant videos. It first showed that from an origin in the Japanese arcade, a significant interest in games of this sort has emerged outside Japan, even if few non-Japanese players are (yet) able to beat their Japanese counterparts "at their own game". This expansion was fuelled by a number of drivers, including the decisions of *danmaku* developers to experiment with porting their games to consoles, the development of Steam and other game platforms and the iconic *Ikaruga* which brought the visuals and gameplay of the genre to an entirely new demographic. The chapter then examined in detail the distinctive form of competition which exists in *danmaku*, analysing several related points. It examined previous work on professional, competitive, or high-level gaming, primarily that into eSports and speedrunning, identifying points of commonality and difference with each and analysing the epistemology of the world *record* as opposed to the world *champion,* proposing the concept of asymptotic competition as a useful theoretical framework for understanding competition which strives towards excellence and perfection

in play against the game as much as other players, and where competition is indirect between participants. It then considered the complex relationship between collaboration and competition in *danmaku* and the absence of any clear notion of sportsmanship (not out of ethical lacks on the parts of the players, but due to the asymptotic structure of this competition which renders notions of sportsmanship non-applicable). It then examined the different rationales players use when engaging in *danmaku* play—since so few players are skilled enough to compete at the highest levels—noting the ability to compete against the game, against one's personal best and the implicit design choices of these games which discourages frustration and feelings of inadequacy amongst less-skilled players. The chapter lastly observed that *danmaku* games remain dominated by Japanese players, although this does not discount the fact that many new players have found *danmaku* to be an enjoyable and engaging form of competition which avoids the moving goalposts of speedrunning and the public contests of eSports whilst still demanding gaming skill every bit as significant as both these other two forms, and it remains to be seen whether the strongest competitors in this form of competition will spread beyond Japan in much the same way as the games themselves (Figs. 2.1 and 2.2).

Fig. 2.1 Screenshot of "Ikaruga" (2001). Accessed on 21/5/2015, available from http://store.steampowered.com/app/253750/

Fig. 2.2 Screenshot of "Crimzon Clover" (2011). Accessed on 21/5/2015, available from http://store.steampowered.com/app/285440/

Note

1. Other sites include the mostly inactive *Restart Syndrome*, the French *shmup.com*, the site *Shmuplations* which contains a range of shmup developer interviews as well as scores and the Chinese *Niyaozao*.

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