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5-2023

Taxonomic Analysis of Video Game Instrument Usages

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MPA 475

15 May 2023

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Instruments have an interesting role to play in the realm of video games because of their interactive nature. Various video games have different levels of interactivity for included instruments, and the ways in which players interact with instruments can be very different from game to game. For example, some games include instruments but give them almost no attention at all by relegating them to background props. Yet, other games include instruments as core components of gameplay and develop mechanics around them. Therefore, this project will seek to break down into categories the various ways in which video games utilize instruments and determine the musicality of these interactions. However, traditional rhythm games including instruments, such as *Guitar Hero* or *Rock Band*, will not be included as points of analysis. Such games are niche in the wider scope of all game genres, but they are fairly popular and many people with a general knowledge of video games are already aware of their functionality.

This paper will primarily be concerned with analyzing in-game objects or assets that can be identified as existing instruments or that are strongly reminiscent of existing instruments in form or function. For example, the game *The Legend of Zelda: Ocarina of Time* allows the player to use an ocarina, which is an instrument that exists in the world. Therefore, *The Legend of Zelda: Ocarina of Time* is a valid game to explore. Additionally, the rocket-powered bongos that players use to race around the tracks of *Donkey Kong Barrel Blast* are obviously not real;

however, they are clearly meant to be some form of bongo drum, so they are also valid to explore.

Musicality is a fairly open concept that can be interpreted in different ways. For this paper, an in-game instrument will be considered to be a musical example if the player has a modest amount of control over the sounds that it can play and the rhythm in which they are played. The previously mentioned sounds that an in-game instrument can create vary. Sounds can include a range of pitches, unpitched percussion sounds, and pre-recorded music samples. Additionally, when considering the amount of rhythmic control that a player has in reference to an in-game instrument, the delay between subsequent triggering of sounds will typically be the most germane point of analysis. Delay is important to consider because many games include a delay or cooldown on various components of gameplay. A bard may have an ability that allows them to play a pre-recorded lute melody that heals teammates, but that ability will likely have a cooldown period before it can be used again. Cooldowns or delays usually make sense when balancing gameplay components, but they are typically detrimental to musical expression. For example, if a percussionist were playing a timpani and they had to wait two seconds after every strike of a drum head before striking another, one would typically consider that percussionist to be hampered in their ability to play.

This is not to say that rhythm and pitch are the only components of musicality; for example, one could typically consider things like phrasing, timbre, or instrumentation to also be components of musicality. However, using an instrument in a video game will almost always be a more limited endeavor than using an instrument in real life, so the application of the idea of musicality should be less stringent. Using a previous example, *The Legend of Zelda: Ocarina of Time* would be considered musical because the player has access to an ocarina that they are able

to play somewhat freely with the in-game controls.[1] Additionally, the *Sorcery!* series of games would not be musical, despite the player having access to a magical flute for the majority play time. The flute is not musical because it is not accompanied by a flute-like musical cue when it is used, so the player has no material in regards to pitch or rhythm to be used expressively.[2]

Many video games tend to have fairly simple objectives or goals. For example, the philosophy of "defeat the enemies on screen and then progress further" could be applied to thousands of video games. Therefore, it should not be too surprising that many of the games that include instruments utilize them in fairly simple ways, such as weapons. When an instrument is used in this fashion, it is not uncommon to see them utilized as a melee weapon. One can see an example of a melee weapon instrument in *Left 4 Dead 2*. *Left 4 Dead 2* is a cooperative zombie survival game where a team of four human players utilizes various weapons and equipment to fight through hordes of zombies as well as special "infected" that have unique powers. Players can come across an electric guitar while making their way through some of the game's maps. If a player finds a guitar they can pick it up, and it will take up their secondary weapon slot. The guitar functions similarly to other melee weapons in *Left 4 Dead 2*: pressing the "fire" button will swing the guitar, and the "shove" button will defensively push zombies backwards. The guitar is unique from other melee weapons because it gives off a distorted feedback sound upon hitting an enemy. However, the guitar in *Left 4 Dead 2* is not musical as it only produces one sound, which the player has little ability to manipulate.[3]

Additionally, some games use instruments as weapons in a less literal fashion. Another archetype of instrument-based weapons utilizes sound itself as an attack. One can see an example of this in *Enter the Gungeon*, which is a roguelike, bullet-hell game with a heavy visual emphasis

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[1] *The Legend of Zelda: Ocarina of Time*. Nintendo 64, Nintendo, 1998.
[2] *Sorcery!*. Windows PC Version, inkle Ltd, 2016.
[3] *Left For Dead 2*. Windows PC Version, Valve Corporation, 2009.

on guns. To clarify, most aspects of the level and enemy design contain some visual element relating to guns and ammo. Following the theme of the game, players can find various gun-themed weapons as they progress through the game; however, the game does include some outlier weapons. For example, the "Face Melter" is an electric guitar, with an upgrade that unlocks an amplifier, that the player can find. Holding down the fire button results in the Face Melter firing off a continuous stream of eighth-note symbols that damage enemies upon contact. While firing, the Face Melter is accompanied by a pre-recorded guitar solo that is about a minute long. However, the Face Melter cannot be considered a musical example because of the player's lack of control over the sounds the guitar produces. The player is only able to manipulate the solo by continuing it via holding the fire button or stopping it by letting go.[4]

A further permutation of the ranged-weapon instrument archetype is area of effect attacks. Specifically, the Face Melter fires sonic attacks in a continuous beam, but there are other instances where sonic attacks spread out in all directions to affect a larger area. One can find an example of an area of effect attack in the multiplayer online battle arena (MOBA) *Defense of the Ancients 2*, most commonly referred to as *Dota 2*. Like most MOBAs, *Dota 2* features a robust item system to allow players to modify their match-to-match experience. The "Aghanim's Scepter" item either gives heroes a new ability, or it improves an existing one. When given an Aghanim's Scepter, Beastmaster gains the ability "Drums of Slom." This ability allows Beast Master to beat a drum progressively faster, with each hit of the drum sending out a circular shockwave that damages all enemies around him. These damaging shockwaves also heal Beast Master for a portion of the damage they deal. The ability is not musical, however. Drums of Slom always plays the exact same pre-recorded rhythm every time it is used, and it has a sixty second cooldown, which inhibits experimentation with multiple linked usages. The only way that

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[4] *Enter the Gungeon.* Windows PC Version, Devolver Digital, 2016.

the ability can be altered is if Beastmaster is stunned or silenced midway through the ability, as that will prevent the full pre-recorded segment from sounding.[5]

Similar to the idea of using an instrument as a combat weapon, instruments are also used fairly commonly as magical tools. When used in this context, instruments are typically combat adjacent. Magical tool instruments tend to be used as a catalyst for magical forces in similar fashion to a wand or a staff.

There is one musical-magic trend that exists in video games that has origins from hundreds of years ago. Specifically, the trope of using instruments as some sort of mechanism for magically induced dance can be found in multiple historical sources. For example, Wolfgang Amadeus Mozart's opera *The Magic Flute*, which premiered in 1791, includes a set of magic bells that is used to magically compel a group of characters to dance away.[6] There is additionally the legend of the *Hårgalåten*, which may be slightly older with origins dating back to 1785. The myth of the *Hårgalåten* involves the children of the town of Hårga being killed as they are compelled by the Devil and his fiddle to dance past the point of exhaustion.[7] Despite being a very old and niche trope, magically induced dance can still be found in the modern medium of video games.

Sorcery! was a series of four adventure gamebooks from the 1980s which were adapted into video game format for both mobile and console play. The player must go on a sprawling adventure with the end goal of obtaining the Crown of Kings. As one might derive from the title, the player has various magical abilities to aid them in their adventure. Among the player's arsenal of spells, there is "JIG." JIG requires a bamboo flute in order to be cast, and it causes

[5] *Dota 2*. Windows PC Version, Valve, 2013.
[6] Schwarm and Cantoni. "The Magic Flute." *Encyclopedia Britannica*, 2014.
[7] "Hårgalåten." *Mama Lisa's World: International Music and Culture.*

characters to dance uncontrollably. The ability works on both humanoid and animal characters. An example of using JIG can be found in The Shamutanti Hills portion of the game. Specifically, two bandits will attack the player while leaving Cantopani village, and they can use JIG to make the bandits drop their weapons and dance. Additionally, the player can either send them back into the village in order to deal with them peacefully, or they can be led into a deep pit, which will kill them. The bamboo flute is certainly a non-musical example of an instrument. The player can only interact with the flute during spell usages, and those usages do not come with an associated musical cue. With no ability to produce tones and no percussive elements, the bamboo flute has no musical applications.[8]

League of Legends (*LoL*) is another example of a game with magically induced dancing. Similarly to the previously mentioned *Dota 2*, *LoL* is also a MOBA-style game with a large roster of characters and a supplementary item system. The character relevant to this example is Sona, whose general character aesthetic is centered around music. Specifically, in the world of *LoL* Sona is a virtuosic "etwahl" player, and her abilities with the instrument have garnered a large fanbase. The etwahl is a fictional string instrument, which takes visual inspiration from flat-laying string instruments like pedal steel guitars or gu zhengs. Sona's etwahl appears to be magically bound to her as it constantly floats in near proximity to her. Sona has multiple musical abilities in addition to her autoattack, all of which are materialized via her playing the etwahl. Additionally, each attack and ability comes with a musical cue. The associated instrumental sound of the etwahl is reminiscent of a harp with some amount of processing to give it a magical feeling. Sona's ultimate, which is typically a character's strongest or most central ability, is pertinent to this category as one of its effects is to make enemies dance involuntarily. Specifically, Sona's ability "Crescendo" sends a large yellow wave of energy in a targeted

[8] *Sorcery!*. Windows PC Version, inkle Ltd, 2016.

direction, and all enemies hit by the wave will take damage and be stunned. Crescendo is unique in regards to stun effects in *LoL* because crescendo is the only ability that stuns enemies by forcing them to dance in place with unique animations. However, it appears that the dancing stun effect is only different in appearance and functions identically to a normal stun. It is worth noting that Sona's etwahl overlaps with other categories because of its plethora of abilities, such as instruments used for healing and instruments used as magic catalysts. For instance, "Aria of Perseverance" can heal teammates; "Song of Celerity" enhances movespeed in a radius around Sona; and "Hymn of Valor" launches a ranged sonic attack. Overall, one could consider Sona and her etwahl to be musical, but not as freely musical as other examples. Access to five separate harp-esque samples with varying levels of cooldown can afford players some mild amounts of musical expression. Additionally, it is possible to edit settings for the *LoL* practice mode in a way that auto-refreshes ability cooldowns. Therefore, if a player were so inclined they could edit the practice mode while using Sona to have more rhythmic freedom with her abilities and their harp sounds.[9]

As for more recent inspiration for the combinations of music and magic, one can look toward the widely popular tabletop role playing game *Dungeons & Dragons* (*D&D*). *D&D* has helped to perpetuate the ideas of music and magic in the modern age with the creation of the bard class, which was introduced in 1976 by way of the *Strategic Review* magazine.[10] Bards are capable of both martial and magical abilities. However, bards differentiate themselves from other magically attuned classes by incorporating elements of artistic expression. Music and musical instruments seem to be the most common ways in which bards express their magic. Additionally,

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[9] *League of Legends.* Windows PC Version, Riot Games, 2009.
[10] Schwegman. "BARDS." *The Strategic Review,* 1976, pp. 11–12.

musical instruments are directly specified as tools that bards can use to focus their magic in the most current *D&D* handbook.[11]

One can most clearly see the influence of *D&D* in regards to using instruments as magical tools in the RPG *Baldur's Gate 3. Baldur's Gate 3* is inspired by and uses a notable amount of material from *D&D*. For example, *Baldur's Gate 3* includes enemies, classes, spells, races, and dice-roll ability check mechanics that can all be found in *D&D.* As a result, players are free to play through the game as bards. As one might expect, players who choose the bard class will experience some musically inspired elements in their gameplay. For example, different classes have different animations for casting spells, and bards use an instrument during their casting animations. The player can select a hand drum, a lute, a lyre, a flute, or a violin as their chosen instrument, all of which will result in a different animation and associated instrumental sound effect for spell casting. The instruments in *Baldur's Gate 3,* however, are not musical. While the player has a choice of the instrument that they pick, they are not able to influence the instrument in a specific or musical fashion.[12]

Hyrule Warriors: Age of Calamity (*HWAC)* is another game which utilizes an instrument as a spellcasting tool, but draws less heavily upon *D&D*. For instance, *HWAC* is fairly different in terms of gameplay because it is a hack-and-slash game, which focuses on action and defeating hordes of enemies over character expression or roleplaying. *HWAC* has a large roster of characters with different abilities to choose from, but Sheik is the only character that uses an instrument, a harp, in her gameplay. Sheik fights using a wide selection of knife slashes, kicks, and acrobatics. In addition to these attacks, Sheik is also capable of casting magical abilities. Any time that Sheik uses a magical ability, she channels it via playing her harp. Each spell has its

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[11] Mearls and Crawford. "Tools." *D&D Player's Handbook*, 5th ed. 2014, p. 145.

[12] *Baldur's Gate 3*. Windows PC Version, Larian Studios, 2020.

own short melody that is played on the harp when it is cast. Yet, the harp is not musical as the player only has access to the pre-recorded melodies associated with each of the spells. Additionally, the player is very limited in their ability to string together melodies because there is a decent amount of delay between the casting animations.[13]

As for an example contrary to the typical high-fantasy inspirations of magic, one can look to *Brütal Legend*, which is moreso inspired by a mix of heavy metal aesthetics and dark fantasy. Specifically, *Brütal Legend* is a third-person action-adventure game that includes unit control and strategy elements for certain portions of the game. *Brütal Legend* opposes the trend of lutes and lyres to instead opt for the use of an electric guitar to cast spells. Specifically, the player starts the game with a Flying V electric guitar dubbed "Clementine," which can use various magical abilities. Early in the game, the player can tap the "guitar attack" button to summon a bolt of lighting at the targeted enemy, or they can hold the button to summon a fiery explosion underneath the target. Using either of these abilities will cause the player to strum the guitar. The player can also press the "axe attack" button and the guitar attack button together to jump into the air and play a powerful power chord upon landing that knocks back enemies with a shockwave. Further into the game the player will begin to unlock "solos," which have further magical applications. Solos are differentiated from the previously mentioned abilities as the player needs to access them from a menu and then play a *Guitar Hero*-esque mini-game to activate them. Each solo has its own associated melody that plays if the character properly performs the solo. Solo abilities can range from summoning the player's vehicle, to melting the faces of weaker enemies, to conjuring a burning zeppelin to crash onto enemies. Solos need to be found in the game world before they can be used, and they have cooldowns to prevent over frequent usages.

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[13] *Hyrule Warriors: Age of Calamity.* Nintendo Switch, Omega Force, 2020.

Brütal Legend is a game that is heavily inspired by music, metal specifically, but it is difficult to consider it as a musical example. For example, the mini-game mechanic does not lend itself well to musical applications. The player is able to play the pre-recorded melodies, but pressing the wrong buttons or the right buttons at the wrong time will not cause the melodies to be altered. A player could attempt to string together multiple solos in a musical way, but this would be hampered as the need to access solos from the menu would cause a noticeable pause between each melody. Additionally, the strumming associated with the fire, lightning, and power chord attacks has little interactivity with the player. These attacks have associated musical cues, but they are very quiet when compared to other in-game sounds, and the player cannot alter them. Additionally, it is possible to overheat the guitar with excessive usages of the non-solo abilities, which limits how much the player can use the abilities.[14]

A further example of the bard's influence in gaming can be seen in the concept of musically applied "buffs." A buff is generally used to refer to things that grant positive bonuses to player characters or NPCs. For instance, if a player in an RPG drank a potion that gave them a temporary bonus to their damage, then that would be considered a buff. The bard can be seen having the ability to buff characters as early 1978 in the *Advanced Dungeons & Dragons Players* [sic] *Handbook*, which states that bards can buff hit probability dice rolls for others. However, this version specifically notes that the bard will inspire other characters through "poetic abilities."[15] It would not be until the 1989 *Advanced Dungeons & Dragons 2nd Edition Player's Handbook* that the bard's power to inspire would be grounded in musical abilities by including singing and songs in the section detailing buffs to certain die rolls.[16] Multiple decades after its

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[14] *Brütal Legend*. Xbox 360, Double Fine, 2009.
[15] Gygax. "APPENDIX II: BARDS." *Advanced D&D Players Handbook*, 1978, p. 118.
[16] Cook. "Bard." *Advanced Dungeons and Dragons Player's Handbook*, 2nd ed. 1989, pp. 42–44.

introduction in *D&D,* many examples can be found of games that include musically derived buffs.

For example, the class-based, first-person shooter *Team Fortress 2* has multiple instruments that grant various buffs to teammates. There are nine different classes, and the "Soldier" class gets access to an assortment of different secondary support items. Three of these items are centered around instruments and function similarly. Specifically, there is the "Buff Banner," "Battalion's Backup," and "Concheror." The first two items are styled after bugle horns while the last is styled after a conch shell. All three require a meter to be filled before they can be used. Specifically, players need to deal a certain amount of damage with their other weapons as none of the instrument items are capable of being used to deal damage. Once the meter has been filled, the player can press the attack button to play a short pre-recorded call and then apply the given buff to surrounding team mates. The Buff Banner gives all surrounding teammates "mini-crits" for a limited duration. Mini-crits provide a 35% increase to the damage output of most weapons in the game. The Battalion's Backup temporarily provides teammates with a defensive buff that reduces damage from critical attacks, sentry guns, and all other sources. The Concheror gives teammates a movement speed buff and lifesteal, the ability to heal oneself for a portion of damage dealt to enemies, for a limited time. Aside from these group temporary buffs, the Concheror permanently gives the player using it health regeneration, and the Battalion's Backup gives its user a maximum health increase. While these items provide various benefits to allies, they cannot be considered musical. The player has no control over the pitches or rhythms. The short melodies are pre-recorded, and the time between playing these melodies is typically very long in order to accommodate for the necessity of filling the meter.[17]

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[17] *Team Fortress 2*. Windows PC Version, Valve, 2007.

While items that provide buffs almost always have some functionality related to support roles, it is possible for buff-centric items to have deeper gameplay complexity. The Hunting Horn from *Monster Hunter: World* is a very interesting example of an item that is an offensive melee weapon, buff contributor, and instrument. *Monster Hunter: World* is a third-person action game with crafting mechanics wherein the player is primarily tasked with hunting monstrous creatures and harvesting unique materials from them. There are fourteen weapon archetypes that players can use; however, each archetype has numerous permutations that the player can utilize via upgrades with in-game materials. The Hunting Horn is unique amongst the weapon archetypes for its musical aesthetics and buff-centric gameplay. Specifically, the Hunting Horn will store specific attack input strings as melodies, which can then be played once or twice to bestow various buffs on the user and their teammates. The player can use the "normal attack," "special attack," or both at the same time for access to three storable attack inputs. The attack animations typically consist of upward, downward, and diagonal bludgeoning strikes. Clearly, the Hunting Horn overlaps with the instrument-melee weapons section for its club-like applications outside of its music mechanics. Different Hunting Horns have different buffs so depending on the one they are using, the player will have to use different input chains to prepare their melodies for playing. Once the player has used the inputs for one of the Hunting Horn's buffs, that melody will then be queued in the top left of the screen. For instance, if a player used "normal attack, normal attack, and special attack" sequentially, then that might store a damage increase buff-melody depending upon the exact Hunting Horn Being used. A player can have up to three buffs queued. The player can then use the "performance" action to use an attack, which transitions into an animation of playing the Hunting Horn. As the player plays the Hunting Horn, they will progress through their stored buff list and apply them in order. After applying the buffs,

the player can use the "encore" action to produce a stronger attack, which again transitions into an animation of playing the Hunting Horn. Buffs applied during an encore will be an upgraded version of the buffs applied during a performance.

While the name "Hunting Horn" might lead some to think that the weapon only draws inspiration from horn instruments, the Hunting Horn has various versions with a fairly wide range of visual inspirations. For example, the "Demonlord Wardrum" has three taiko drums; the "Sonorous Eisfyl" appears to include multiple sets of suspended chimes; the "Alatreon Revival" is inspired by a pipe organ; the "Legia Sectored" appears to be a lyre; the "Queen Chordmaker" is a large bell; the "Royal Song Symphony" is an ornate glockenspiel; and the "Fatalis Menace Wailer" is an electric bass. Additionally, every weapon in the game has one unique melody that plays during the performance or encore animation. It is worth noting that while all Hunting Horns can make use of multiple melody buffs, each Hunting Horn will only play its one unique melody regardless of what buff it is progressing through during performance and encore. Melodies are typically reflective of the instrument that each Hunting Horn draws its inspiration from. Some Hunting Horns even have audio samples of the monsters whose parts were needed to craft them in their melodies.[18]

The Hunting Horn is a very interesting weapon that has clear musical inspirations from various sources. However, the Hunting Horn does not have musical capabilities. Playing music is part of the Hunting Horn's gameplay formula, but the musicality of the Hunting Horn is hampered because it is only capable of playing a single pre-recorded melody at a time based on the Hunting Horn that is currently being used by the player.

In addition to the concept of buffs, the inverse in the form of "debuffs" also exists. To specify, a debuff is something that makes a player character or NPC weaker or less efficient.

[18] *Monster Hunter: World.* Xbox One, Capcom, 2018.

Once again, examples can be found of musically induced debuffs in *D&D* prior to most examples found in video games. For example, the *Advanced D&D Players Handbook* notes that bards have a class ability that makes them capable of "charming most creatures" with their "singing and playing." Also, it is possible for charmed characters to fall prey to a bard's suggestion.[19] The 2nd edition of *Advanced Dungeons & Dragons* drops this ability in exchange for bards being able to influence the moods or emotions of non-hostile individuals and large groups.[20] The bard class regains the charm and suggestion in *Dungeons & Dragons 3.5 Edition*.[21] Also, the addition of class specific cantrips, a sort of beginner level spell, gives bards debuff abilities such as "lullaby." The ability gives affected targets disadvantaged rolls for spotting and listening checks.[22]

The influence of bards with respect to debuffs in video games can be seen very clearly in *Final Fantasy XI Online* (*FFXIO*), which has a named bard class of its own. *FFXIO* refers to its classes as jobs, of which there are twenty-two. The bard job is primarily used in a support capacity. The primary objectives of the role are to buff allies, like in the previous category, while also enfeebling enemies. The bard spell system is comprised of songs. Specifically, bards have access to an extensive list of songs that all have unique effects, and bards can play these songs with a string instrument, a wind instrument, or by singing. As for an example of a song debuff, there are the threnody songs. There are eight elemental typings in *FFXIO*: fire, ice, lightning, water, wind, earth, dark, and light. Each typing gets a specific threnody song, which will lower defense to the corresponding types when cast on an enemy.

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[19] Gygax. "APPENDIX II: BARDS." *Advanced D&D Players Handbook*, 1978, pp. 118.
[20] Cook. "Bard." *Advanced Dungeons and Dragons Player's Handbook*, 2nd ed. 1989, pp. 42–44.
[21] Tweet. "BARD." *Dungeons and Dragons Player's Handbook*, 3.5 ed. 2003, p. 29.
[22] IBID., p. 181.

It is difficult to consider the musically inspired abilities of *FFXIO*'s bards to be musical. Similar to the Hunting Horn, bards in *FFXIO* only get one melody per instrument type, except that it is further restricted by lack of new melodies based on unique equipment. Whereas *MHW* had a melody for every individual Hunting Horn, *FFXIO* only has one melody each for the equipment categories of string instruments, wind instruments, and voice. It is worth noting that the vocal melody is dependent upon the race of the player character. While the melody stays the same, it may be transposed higher or lower depending on the race of the character. Additionally, to switch between these three melodies, the player needs to change their instrument in a menu. The necessity of accessing the menu would add noticeable delay to any player trying to link together multiple melodies.[23]

Eden Eternal (*EE*) is another fantasy MMO-RPG with a bard class. Unlike *FFXIO,* bards in *EE* only have guitars to use for accessing their spells, referred to as skills. *EE* bards primarily have abilities pertaining to buff-based support gameplay, but they are diverse enough to also have some involving direct damage, healing, and debuffs. Of note to this category is "Burning Metal," which is a skill that combines both direct damage and a debuff. Specifically, Burning Metal creates a target area that damages all enemies per second with fire damage for twelve seconds. Additionally, Burning Metal debuffs enemies by applying a defense reduction, which can be stacked up to three times. Bard skills in *EE* come with an associated musical cue to go along with the animation of the ability. The musical cues are based on short guitar riffs, but the type of guitar sound is linked to the nature of the skill. For example, "Song of Illusion" is a buff skill that provides defense and evasion to nearby party members, and its sound is reminiscent of an acoustic guitar or lute. However, "War Rhyme," which is a buff that gives nearby party members an increase to damage, has a clearly distorted electric guitar tone to match the more

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[23] *Final Fantasy XI Online.* Windows PC Version, Squaresoft, 2002.

aggressive nature of the ability. The various guitar melodies available to the player through the bard skills allows players for some restricted, but still musical, expression. There are ten separate skills, and most have zero cooldown. So the ability to creatively string together multiple melodies is there for players who seek it.[24]

The final fantasy-and-magic-adjacent category of instrument usage yet to be discussed is healing. Healing is similar to both buffs and debuffs in that it is most commonly a support activity; however, healing is somewhat different enough to be considered its own area. In the same way that directly dealing damage to an enemy would not be considered a debuff, directly replenishing a character's health is typically not considered a buff. It is not too difficult to make the leap in thinking to connect music and healing. Soothing music can often aid in relaxation or minor stress relief. Further, the practice of music therapy has been demonstrated to have real, appreciable positive effects on certain health issues.[25] Therefore, the use of instruments as catalysts for healing in video games does not seem too far fetched. For further examples of instrument-centric debuffs, refer to the "Instrument as a negative status inflictor (Debuffs)" section of the appendix.

To begin, the previously mentioned example of *Team Fortress 2* includes the Medic class amongst its nine playable classes. Expectedly, the Medic is a heavily support oriented character who specializes in healing, though he does have some capacity for buffing teammates. Interestingly, the Medic does not actually have any equipment that is reminiscent of an instrument. One could make the argument that the Medic's assortment of medical saw-centric melee weapons is reminiscent of the musical saw, but the motif of giving a medic class surgical tools would make that unlikely. Rather, the Medic is able to somehow use a type of bonesaw as a

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[24] *Eden Eternal*. Windows PC Version, X-Legend Entertainment, 2010.
[25] Kamioka et al. "Effectiveness of music therapy." *Patient preference and adherence* vol. 8. (16 May 2014): 727-54. doi:10.2147/PPA.S61340.

violin. When holding a melee weapon the Medic may perform different taunt animations based on the specific weapon being held. However, the "Amputator," "Vita-Saw," and the stock "Bonesaw" all share the same taunt animation: the Medic holds the weapon as if it were a violin and then bows it with a non-existent bow. All three also share an associated violin melody that plays with the taunt; however, for most of these melee weapons, the taunt is purely cosmetic and has no in-game consequences. The Amputator is unique because it applies an actual benefit to the violin taunt. Particularly, when a Medic taunts with the Amputator it will heal all friendly units within a radius around the medic. The Amputator offers a helpful auxiliary mode of healing for the Medic as the primary means of healing available to a Medic, the "Medi-Gun," is only able to heal single targets. Therefore, the ability to heal multiple players at once, with the downside of being locked into a taunt animation, does have its occasional use cases.

Despite the beneficial functionality of the Amputator it is difficult to consider it to be a musical example. The violin taunt that comes with the Amputator does have multiple melodies that can be played, but there is no way to pick which melody is to be played during any given taunt as the order appears to be randomized. Additionally, the taunt can only be interrupted by either dying or being lifted off the ground by an airblast or an explosion. Effectively, a player looking for musical expression would be limited to linking together multiple full length melodies with no real way of arranging their order, which is difficult to consider musical.[26]

Another bard-esque way in which instruments are used in video games is to utilize them as a method of making money via entertaining crowds. Specifically, some games allow players the option to perform music in public spaces for the primary purpose of earning currency. Most games using this mechanic tend to take place in fantasy settings.

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[26] *Team Fortress 2*. 2007.

One can find one of these money making mechanics in the open-world, fantasy RPG *Fable 3*. Various towns and hub areas in *Fable 3* include interactive signs with a bag of gold on them. The player is free to interact with these signs in order to activate the "lute hero" mini-game. The mini-game consists of pressing buttons on the controller in time with corresponding symbols being shown on the screen. Similar to a game like *Guitar Hero,* pressing these buttons correctly is supposed to convey to the player that their character is properly playing their instrument, a lute in this case. Completing one portion of the lute hero minigame will reward the player with some gold and then bring them to another faster portion. Each subsequent portion of the mini-game increases the amount of gold that the player receives upon completion, up to ten times the initial amount. While the mini-game may be helpful for players looking to make more gold, it is unfortunately not musical. The player is able to pick a predetermined song to be played, but they have very little influence over the song because of the mini-game format in which it is played. Essentially, the only way a player could make the song they picked sound different would be to intentionally not play a note so that the corresponding part of the melody does not sound. Yet, such an endeavor would be highly restrictive and not conducive to musical expression.[27]

Two Worlds II (*TWII*) is a very similar example when compared to *Fable 3,* though it is worth noting that *TWII* released roughly two weeks after *Fable 3.* Considering the long production cycle of video game development, it is likely that both games ended up with similar systems as they share the same genre of open-world, fantasy RPGs. Once again, *TWII* allows players to participate in a *Guitar Hero*-esque mini-game that will then award the player with varying levels of gold depending upon the quality of the mini-game's completion. Interestingly, *TWII* has a more robust and integrated system when compared to *Fable 3.* For example, *TWII* has

[27] *Fable 3*. Xbox 360, Lionhead Studios, 2010.

five instruments instead of just one: lute, lyre, drum, flute, and violin. Also, the player can freely pick multiple pieces of music and play anywhere, not just at designated locations. Players are able to do this because *TWII* integrates instruments and music into the world physically via inventory options. Players are able to purchase instruments and sheet music from specific merchants. Then, a player can choose to play anywhere by accessing the instrument from their inventory and selecting a piece of sheet music, which will then trigger the mini-game to start playing. While these changes to the music system do help *TWII* differentiate itself from *Fable 3,* they ultimately do not result in the game being anymore musical. The same problem still applies in that the player can only interact with the instruments via a mini-game. The only control the player has is to either play the preselected melodies or to selectively leave out notes for some form of personalization. Either way, both methods are restrictive.[28]

One final example of earning money through in-game performances can be seen again with *Baldur's Gate 3.* However, *Baldur's Gate 3*'s usage is interwoven with other novel mechanics, which differentiate it from the two previous examples. As mentioned previously, *Baldur's Gate 3* draws heavily from *D&D,* which gives players who choose the bard class and its music-based gameplay options. In this case, bards have access to the "perform" ability which allows them to start playing one of four songs. If multiple player-controlled bards use the perform action in the vicinity of each other, then they will play the selected song together on different instruments. Once a bard has started playing, they draw attention from nearby NPCs who will gather around to watch the performance. NPCs watching the player's bard may occasionally offer up some gold, based on an ability check, for the performance; however, the primary function of perform is to serve as a diversion. For example, there may be a guarded door that the player wants to gain entry to. The player could then set up a bard performance about

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[28] *Two Worlds II.* Windows PC Version, Reality Pump Studios, 2010.

twenty feet from the door, which would then draw the guards away from their position. With the door unguarded, the player could then direct another one of their characters to go lockpick the now unguarded door. While novel, this mechanic cannot be considered musical. The player is more or less selecting a song and then selecting which instrument it is to be played on, and that is all. The player has no real ability to experiment or create their own melodies or ideas with the instruments or available music.[29]

Moving on, another common way that instruments are used is to have them serve as parts of a game's environment or world. While the instances may be niche, the inclusion of an instrument in a space can add character. For example, a haunted mansion or a church may feel more "complete" with the addition of a piano or bell respectively. Instruments used in this capacity are typically static pieces of a game map, which have varying levels of interactivity.

One can look towards a game like *Metro 2033 Redux* for an example of a low interactivity environment-feature instrument. *Metro 2033 Redux* is a first person shooter with survival horror elements set in a post-nuclear apocalypse Russia. The majority of the game is set in a massive underground network of Russian metro tunnels. Therefore, the game benefits from having different sections of the tunnel being designed differently, so as to not have the whole game feel like the same gray hallway. For example, the very beginning of the level "Exhibition" begins with the main character leaving his room, which is meant to be much more inviting than later sections of the game. In order to make the room feel more immersive, there are multiple interactable objects that the player can tinker with. One of these objects is a guitar in the corner of the room. The player can press the "use" button to play a pre-recorded strumming sound; however, the guitar is not musical. The player has no control over which notes are strummed on

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[29] *Baldur's Gate 3*. 2020.

the guitar, and there is a one-to-two second delay on consecutively strumming the guitar so there are rhythmic restrictions as well.[30]

There are also games that allow the player a greater level of interactivity with environment-feature instruments. For instance, *Overwatch 2* includes instruments in some of its maps that players can interact with musically. Like most round-based objective shooters, *Overwatch 2* includes a short pre-round section prior to a match where players can strategize or pick their characters. During the pre-round players who are not on defense are stuck in their team's spawn room. As a result, spawn rooms often have interactable assets for the players to amuse themselves with. For example, the map "Nepal" has a basketball, which players can try to shoot or melee into a hoop. Interestingly, the maps "Dorado" and "Paris" both have functioning instruments available during the pre-round. Dorado includes three separately pitched bells built into the attacker's spawn area, which serves as a Spanish-style mission. Attacking a bell causes it to play its single pitch, and there is very little delay present when producing consecutive tones. While only having three pitches is limiting, the bells can certainly be considered musical for their ability to let players create unique melodies. It is common knowledge in the *Overwatch 2* community that the *Futurama* theme can be played on the bells, and many videos have been uploaded demonstrating players performing the theme.[31] Also, the map "Circuit Royal" has a piano with an even greater level of interactivity. Specifically, the attackers' spawn room features a full eighty-eight key grand piano with fully functional keys. Once again, players can play the instrument by attacking the keys that they want to use. Obviously, the piano is musical because

[30] *Metro 2033 Redux*. Windows PC Version, 4A Games, 2014.
[31] "Futurama Theme Song in Overwatch." *YouTube*, 2016.

of the flexibility given to players when playing it. In fact, the piano is so flexible that there are a plethora of videos uploaded of players performing renditions of their favorite songs using it.[32]

Occasionally, game world instruments go beyond amusing distractions and venture into the realm of gameplay importance. For example, an instrument might be a component necessary for the completion of a puzzle. One can see such an example in *Resident Evil Village*. *Resident Evil Village* is a survival horror shooter set in the Resident Evil universe. Players need to fight their way through various monstrous enemies while managing limited resources and solving puzzles. Consequently, a piano is involved in solving a puzzle in the "Dimitrescu Castle" section. Once a player interacts with the piano, they will be locked into a fixed position facing the piano while a piece of sheet music is displayed. Solving the puzzle is very simple. The player must simply match the notes from the sheet music with the piano keys in the correct order with any rhythm. There is no penalty for playing the wrong note; the player just needs to eventually hit the correct key for the portion of the sheet music that they are at. Completing the puzzle will reward the player with a key that they will need to progress further in the game with. This piano puzzle serves as a musical example, even if it is limited. The player has just under three octaves of white keys to play with. The delay between sequential piano key presses is also fairly low, so the player is not too limited with their rhythmic choices. However, the keys can only be played by manually scrolling to each individual key and then selecting it. Therefore, playing a C and then a C an octave higher would be very inconvenient. Overall, the player is able to create musically expressive melodies, albeit in an inconvenient fashion.[33]

A very similar concept to an object being a game-world feature is something being a physics object. Whereas the previous category typically focused on static objects that are a set

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[32] "Overwatch: Best Piano Players." *YouTube*, 2019; *Overwatch 2*, Windows PC Version, Blizzard Entertainment, 2022.
[33] *Resident Evil Village*. Playstation 4, Capcom, 2021.

piece of a game's world, physics objects tend to be free moving items that exist within a game world. As the name suggests, physics objects are usually present in games with physics engines or some sort of system that calculates how objects in the game world should react when interacted with. For example, *Half-Life 2* is a very popular game with a physics engine. A tree could be considered a feature of the game world as trees in *Half-Life 2* are static objects, which are a part of the game's environment. However, a steel barrel would be better classified as a physics object. Steel barrels can be picked up and thrown, and they adhere to the expected laws of the game world. For instance a thrown barrel will only go so far before it hits the ground as a result of gravity, and a barrel tipped on to its side will roll as one might expect one to do in real life.[34] Games with physics systems that include instruments that behave as physics objects are fairly rare, as meeting both requirements is rather niche.

   Duck Game is a party combat game in a similar vein to the *Super Smash Bros.* franchise. Instead of players picking characters with unique moves, players in *Duck Game* all have the same abilities. The gameplay options are dictated by the weapons that players find placed throughout the various maps in which the game takes place. In addition to weapons, characters will find random objects on the map. These objects include things like rocks, crates, and barrels. Amidst the random objects that can be found in *Duck Game*'s maps, the player will occasionally find instruments such as a trombone, keytar, saxophone, and trumpet. The instruments are special amongst non-weapon items as the player is able to interact with them beyond simply throwing them. When a player is holding a trombone, keytar, or saxophone, they can then press the "jam" button, which then grants the player an array of notes to play on the instrument based on their number keys. Specifically, the player has access to thirteen notes starting with C on the 1 key and ascending via half steps to an octave higher C on the erase key. The delay between playing notes

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[34] *Half-Life 2*. Windows PC Version, Valve, 2004.

is very short, so the player also has a lot of rhythmic freedom. The instruments from *Duck Game* are definitely musical. The player has access to three physics objects in the game that serve as functional instruments. The trumpet is an exception: it is somewhat hindered as it only has access to three notes instead of thirteen. The keytar, trombone, and saxophone have a chromatic octave of notes that can be played, and the rhythmic capabilities of the instruments are unhindered by excessive delays. Also, there is some overlap with the previous category as some maps have playable drum kits that are stationary and therefore act like environment-feature instruments. The drum kits do not utilize the jam functionality and instead play different drum sounds based on directional movement inputs and standard gameplay inputs, like the "shoot" key. The drum kits have more than enough drum sounds and rhythmic control to be considered musical in addition to the physics focused instruments.[35]

While most categories of instrument usage tend to have varied levels of interactivity, some categories, such as the following, lend themselves to inherently non-musical applications. To clarify, some games allow NPCs to use instruments, which naturally steers away from musicality as the player has even less control over them than usual. Generally, games that include NPCs using instruments tend to use them as a way to enhance a space or add ambience. For instance, a game set in a modern city might feel more lived in if there were NPC street performers located on certain street corners.

A very typical example of an "NPC musician" can be seen in *Red Dead Redemption 2*. Specifically, the game includes saloon pianists in many locations across the game map. *Red Dead Redemption 2* is an open world adventure game set in 1899 which takes heavy inspiration from the motifs of the Wild West and outlaws. Therefore, the inclusion of saloon pianists helps to immerse the player in the world and reinforce the setting. The pianists provide a source of music

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[35] *Duck Game*. Windows PC Version, Landon Podbielski, 2015.

that is naturally derived from the environment the player is in rather than it appearing

sourcelessly via the soundtrack. In regards to gameplay, pianist NPCs will remain seated in front

of a piano while cycling through various animations meant to roughly sync up with the songs

that they are playing. The pianists will play through a mid-sized repertoire of mostly

time-period-accurate songs so long as they remain undisturbed; however, should a player attack a

pianist or cause a disturbance around them, then they will cease playing and flee the area like any

other NPC. Also, the saloon pianists reinforce the setting as they are associated fairly strongly

with the aesthetics of the Wild West. As one might expect, *Red Dead Redemption 2*'s saloon

pianists and the pianos that they utilize are not musical. The only influence the player has is to

stop a pianist who is already playing.[36]

      A similar example would include the traveling merchants found across *Elden Ring's* open

world game map. Many of the merchant clan members can be seen playing some type of

fictional bowed instrument reminiscent of an erhu. Not all merchants play, but those that do will

usually play continuously to themselves until a player interacts with them. Generally, the playing

serves no functional gameplay purpose, like *Red Dead Redemption 2*. The usage of the

merchants' instruments and the songs they play seems to primarily serve as a small bit or world

building.

      However, there are some rare occasions where the music of the merchants has some

gameplay application. For example, the music can be an indicator that a merchant is nearby.

Most merchants are in easily spotted locations, but some, like *Elden Ring*'s abandoned merchant

in Siofra River, are off the beaten path. A player could easily pass by a hidden merchant's

location if not for hearing their songs in the distance. As one might expect, the merchants and

their instruments are not musical. Since the instrument is being used by an NPC, the player has

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[36] *Red Dead Redemption 2,* Windows PC Version, Rockstar Games, 2019.

very little control over the instrument. The player can only influence the playing of a merchant by making them stop via interacting with or attacking them.[37]

One of the most gameplay-centric applications of NPC-played instruments can be found in *Stranglehold*, which is a third-person action shooter in a similar vein to the *Max Payne* game series. Chapter 3 of the game, "The Mega Restaurant," takes place in a large sprawling restaurant. The last section of the level prior to the boss encounter occurs in a large lounge room with a jazz trio, including a drummer, saxophonist, and pianist, that is actively playing. As soon as the player enters the room, various goons will hold the player at gunpoint, and the band will stop playing. One of the goons will then look at the band and tell them to continue playing. The player will then need to dispatch all of the enemies, but their mission objective will give them specific instructions to protect the band and keep at least one member alive. The musicians can be killed either by the player erroneously shooting them or if stray enemy bullets hit them. The musicians will continue to play throughout the encounter, but if a musician dies then their respective part of the music will stop sounding. The jazz band and their associated instruments are, however, not musical. The player has little influence over the musicians: they can either attack the musicians, allow enemies to attack the musicians, or defend the musicians. These decisions are meaningful, but they are not conducive to musical applications through the player.[38]

From the previous categories, one can see that there are multiple examples of both players and NPCs using instruments; however, there are also games in which players and NPCs *are* the instruments. To begin, *Super Mario 64*, the classic 3D platformer for the Nintendo 64, includes an NPC enemy that takes the form of a piano. Specifically, Big Boo's Haunt level includes a sentient piano that will attack the player once they have come too close to it. Prior to

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[37] *Elden Ring*, Windows PC Version, FromSoftware Inc., 2022.

[38] *Stranglehold*. Playstation 3, Midway and Tiger Hill Entertainment, 2007.

the player character approaching the piano, it behaves similarly to previous examples as a static piece of the environment. The particular level that the piano can be found in takes strong inspiration from the haunted house motif, so the piano adds to the ambience of the space. Also, once the player character approaches the piano, it begins to continually chase after them in a hopping fashion whilst the lid opens and closes. The hopping is accompanied by a loud clanging noise, and the piano lid has teeth to approximate a mouth. The evil piano has no musical applications. It effectively serves as an enemy that is meant to frighten the player once they have moved too close to it. The player is unable to play any notes of the piano, and the noises that it makes when it attacks the player are not musically derived.[39]

More instrument enemy NPCs can be found in the turn-based RPG *Mother 3*. Specifically, the player needs to fight the mini boss trio of Jealous Bass, Gently Weeping Guitar, and Beaten Drum in the Club Titiboo attic in order to to progress further on in the game. The instruments appear to have gained sentience via strong feelings of neglect. The guitar has a broken string, the drum has a torn head, and the bass explains that it is unused because its owner found a new bass to play. Everytime that one of the trio attacks, it is accompanied by a musical cue reflective of each instrument: the guitar has a distorted strum; the bass has a melodic line; and the drum has a short roll. As expected, Jealous Bass and his allies are not musical because the player has no real influence over them. The trio only play pre-recorded segments when attacking, and they cannot be altered by the player.[40]

In addition to NPCs that are instruments, there are also player characters that are instruments such as Big Band from the fighting game *Skullgirls*. Previously known as Ben Birdland, Big Band was given an experimental treatment to save his life after an attempt on his

[39] *Super Mario 64*, Nintendo 64, Nintendo, 1996.
[40] *Mother 3*, Game Boy Advance, Hal Laboratory, 2006.

life left him mutilated. The treatment in question gave Big Band a new working body by essentially turning him into a cyborg comprised of all manner of machinery and instruments. Big Band's lore is reflected in his gameplay as nearly all aspects of his gameplay involve the instruments that make up his body. Big Band's attacks typically involve him producing an instrument for underneath his overcoat, and the intensity of a chosen attack seems to dictate the size of the instrument that he uses. For example, Big Band's light kick normal has him using a kick drum beater to attack, while his heavy punch normal utilizes an oversized saxophone bell that is much larger. Big Band can be seen using timpanis, cymbals, organ pipes, a trumpet, a triangle, a french horn, trombones, a clarinet, bagpipes, and a tambourine in his attacks. Even visually, Big Band is reminiscent of a saxophone considering that one can see saxophone keys on his side and a saxophone neck on his back. Despite the many allusions to music and instruments in his design and gameplay, most of Big Band's abilities are not conducive to actually making music. For example, Big Band might be able to use the previously mentioned instruments to attack and their usage does typically come with an associated musical cue, but it would be hard to use them to make music. For instance, Big Band's timpani attack is very slow and the player cannot change any inputs to affect the pitches or rhythm of the timpanis.

However, Big Band does specifically have one tool meant for musical expression in the form of his trumpet. To clarify, Big Band does utilize a trumpet to attack normally by using medium punch; however, holding medium punch will enter Big Band into a sort of performance state. While in the performance state, Big Band will not execute any conventional attacks if an attack input is pressed. Rather, Big Band will play the notes of a chromatic scale starting on C based on a formula of his attack inputs.[41] By holding up or down during any of these inputs, the player can transpose the note being played up or down an octave. Therefore, Big Band has three

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[41] KStep. "The Big Band MP." *Skullheart,* 2013.

chromatic octaves to utilize for musical expression. Additionally, there is almost no delay when playing multiple notes in sequence. As a result, Big Band can be considered one of the most musically expressive examples thus far. If the player wants to end the performance state, they can simply press nothing for a second, which causes the trumpet to be dropped, or they hold forward during an input to execute an attack as if the performance state was not active.

In most contexts, a player will probably just use the trumpet as a normal attack because *Skullgirls* is a fighting game and continually playing notes instead of dynamically attacking would leave the player vulnerable. However, a player may feel inclined to actually play the trumpet as a form of taunt or to amuse themself or their opponent. Additionally, the player may play the trumpet during Big Band's level 5 super, "Satchmo Solo / Satchmo Death Blow." Upon activation, time freezes, and Big Band is given a few seconds to play anything with no fear of retaliation from the opponent. There is enough interest amongst the *Skullgirls* community in Big Band's musical capabilities that one can find various guides on places like YouTube or Reddit.[42] Popular tunes from media like anime or other games have been transcribed by players into *Skullgirls*'s unique attack input based note system and shared so that other players can perform the melodies during online matches or when in practice mode.[43]

Designing a character entirely around the concept of an instrument may be an obtuse or difficult task because instruments are distinctly shaped and they do not necessarily mesh well with human or animal anatomy. Therefore, if someone wanted to incorporate an instrument into a character design in a lesser capacity, they might consider adding a cosmetic accessory of an instrument. Many games allow for general cosmetic additions for this purpose. Games will often have a base character design that players are allowed to personalize by adding all manner of

[42] "Big Band covers." *YouTube,* 2021; KoltJolt. "Big Band Solo Songs?" *r/Skullgirls,* 2017. *Reddit.*
[43] *Skullgirls*. Windows PC Version, Hidden Variable Studios, 2013.

aesthetic changes. For example, *Halo: Reach* provides players with a default character to represent themselves in multiplayer scenarios; but the player has the option to customize their default armor in regards to the helmet, shoulders, wrists, utility, visor color, knee guards and armor effects.[44] Many games have instrument focused cosmetics that players can use to express their passion for music.

For example, the previously mentioned *Team Fortress 2* has a very robust cosmetic customization system. The current version of *Team Fortress 2* has over 1000 cosmetic items divided between the 9 playable classes. While they are few and far between, there are some instrument cosmetics that players can use. The "Demoman" can equip the "Melody of Misery," which places a set of bagpipes on his back. The "Pyro" can equip the "Burning Bongos," which slings three bongo drums across the Pyro's chest. The Scout has access to the "Electric Twanger," which slings an eclectic guitar across the Scout's back. These items have very little appreciable effect on gameplay because they cannot be interacted with. It is worth noting that *Team Fortress 2* makes much of its money via sales of cosmetics. *Team Fortress 2* is a free game, so no money is made when a player downloads the game.[45] As one might expect, *Team Fortress 2*'s cosmetic instruments are not musical. With no ability to interact with them, players have no ability to create music of any kind with them.[46]

The battle royale, third person shooter *Fortnite* has found great success using the model that *Team Fortress 2* pioneered. *Fortnite* is also a free-to-play game that makes its profit via the sale of cosmetics. While skins tend to be the most coveted cosmetics, players are able to customize other aspects of their characters such as gliders, backbling and pickaxes. Among the plethora of *Fortnite* cosmetics, there are a few instrument-based examples. The "Boom Bap" is a

[44] *Halo: Reach*. Xbox 360, Bungie Inc., 2010.
[45] Dyer, Mitch. "Team Fortress 2 Made Valve Super Rich." *IGN*, 2016.
[46] *Team Fortress* 2. 2007.

pickaxe cosmetic that turns the player's pickaxe into a double-sided hammer with both heads being drums. Additionally, "Stringles" is a pickaxe cosmetic that reskins the pickaxe into an acoustic guitar with a smiley face on it. The Boom Bap appears to have a bass drum sound effect added for when it hits something, but Stringles has a dull thud which does not seem to relate to its sound profile as a guitar. While these examples have slightly more interactivity than the *Team Fortress 2* examples, they cannot be considered musical. The player can create percussion-style music with no pitches to work with; however, there is a decent amount of delay between pickaxe swings, which heavily restricts what the player would be able to create.[47]

Similar to cosmetic items, taunts and emotes in video games are rarely central to any in-game mechanics. Rather, taunts and emotes usually serve as fun additions to a character's abilities, which can be beneficial places for conveying extra flair or characterization. *Brawhalla*'s use of instrument-focused emotes most closely aligns with the cosmetics from the previous section. Brawlhalla is a free-to-play fighting game that is functionally very similar to games from the *Smash Bros.* series. As opposed to emotes being character specific, *Brawlhalla* has a universal emote system that allows any character to use any emote that the player has unlocked. Most emotes need to be purchased with premium in-game currency or through a special condition like a "viewership reward." A select few of these emotes are instrument-centric. "Drum Solo," "Keytar Solo," and "Lyre Solo" all involve the player character playing a looping pre-recorded passage on the instrument mentioned in the title. "Skeleton Dance" slightly deviates from the rest as the player will play a trumpet and dance with a gyrating skeleton. As before, the emotes offer no in-game benefit and serve as amusing inclusions for the player. *Brawlhalla'*s emotes are not musical. The player only has access to a single pre-recorded looped passage based on the emote that is being used. The player has no real way of altering musical material of these

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[47] *Fortnite*. Xbox One, Epic Games, 2017.

passages, which leaves them with little room for musical expression. Additionally, the player has

to access emotes through a menu, which adds a delay to any player trying to string multiple

emotes together.[48]

Vampire Savior: The Lord of Vampire (*VSTLV*), alternatively referred to as *Darkstalkers 3*, is the third installment of the *Darkstalker* fighting game series. The game sets itself apart from

other fighting games with its unique roster of characters. Specifically, *VSTLV*'s roster is heavily

inspired by classic horror with characters taking inspiration from Dracula, Frankenstein's

Monster, mummies, werewolves and so on. *VSTLV* is more traditional with its use of taunts in

the sense that all playable characters have a special taunt animation, which can be activated by

pressing the dedicated taunt button. The resurrected Australian-zombie rockstar Lord Raptor is

of specific note as his taunt utilizes an instrument. Specifically, Lord Raptor's taunt involves him

performing a guitar spin maneuver with an electric guitar and then strumming a chord. Like most

taunts, Lord Raptor's has no gameplay benefit and mostly serves as an amusing way to give him

more character. Lord Raptor's taunt is not musical. The player has no control over the pitch or

notes of the chord that is strummed, and the chord is played at the end of the animation which

would make stringing together multiple soundings of the chord difficult.[49]

Some previous categories have skewed towards being less musical in their usage of

instruments, but the inverse is also true. For example, some games include MIDI-capable virtual

instruments. To clarify, these games allow the player to feed MIDI versions of compositions into

in-game instruments that will then be played in the timbre of whatever the particular instrument

is. Games that include this functionality typically do not require its usage for anything central to

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[48] *Brawlhalla.* Windows PC Version, Blue Mammoth Games, 2017.
[49] *Vampire Savior: The Lord of Vampire*. Playstation Network Version, Capcom, 2012.

gameplay. Rather, games with MIDI capable instruments are usually online games that use the feature for the purpose of allowing players to amuse themselves.

Mordhau includes one example of a MIDI instrument, which is a lute. *Mordhau* is a multiplayer medieval combat game. As one might expect the player has access to various pieces of equipment that are evocative of medieval times, such as helmets, spears, shields, bows, swords, and so on. Additionally, the player has access to a lute, which has some crossover with a previous category as it can be used as a relatively weak blunt weapon. There is also a shawm, a type of antiquated woodwind instrument, which can be used as a thrown projectile. The player can use the typical control scheme to play a few notes on either the lute or the shawm. However, the instruments are clearly intended to use MIDI if the player wants to create anything musical because the standard control scheme is very restrictive. By inputting a MIDI file, the lute or shawm will begin to automatically play whatever the composition is, so long as it fits within the instrument's range. It is worth noting that while the lute and shawm are MIDI capable, players need to download a third party application to get the instruments to play MIDI files. Specifically, one would need to download the program "lutebot" and then configure it with their Mordhau game files.[50]

Playing in the midst of a multiplayer match serves almost no benefit. Yet, a minority of players will still go out of their way to fill a sort of unofficial "bard" role during matches. These players tend to play widely known songs for the amusement of players, and they will usually forego all combat unless they are defending themselves. However, some players prey upon this trend by pretending to be bards and then attacking those who have let their guard down. I captured my interactions with other players over the course of one game, whilst playing as a

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[50] "MORDHAU LUTE BOT SONGS." *YouTube*, 2019.

bard.[51] The responses to my playing are mixed, there are examples of enemy players actively listening to the music: letting me pass without attacking, damaging me but not killing me, and outright killing me. Most of my teammates seemed to be indifferent to my playing. One can specifically see an example of deceiving an enemy player. After having established myself as a non-threat with my performance, I proceed to attack an unsuspecting archer. Hitting a player with a bow will cause the bow to be dropped, so I knew the archer would be an easy target. I did die as well because the archer's teammates noticed my aggression.

The lute and shawm are musical as they allow players a wide range of pitches to work with in addition to rhythmic freedom. It is true that most players tend to just download and play popular MIDI files, but they are still free to create original compositions and play them in game once they have been converted to MIDI.[52]

Another game with MIDI instruments is the multiplayer survival game *Rust*. Unlike *Mordhau*, *Rust* has multiple instruments to work with, and they have no other functionality outside of playing music. The game released a DLC pack in 2019 that included ten instruments: Acoustic Guitar, Canbourine, Cowbell, Jerry Can Guitar, Junkyard Drum Kit, Pan Flute, Plumber's Trumpet, Shovel Bass, Sousaphone, Wheelbarrow Piano, and the Xylobone. The instruments are meant to be DIY renditions of existing instruments to fit with the game's themes of crafting and survival. All of the instruments are able to be played in three different ways. Specifically, players can use the in-game controls; they can feed MIDI files into the game; or they can connect a MIDI controller. First, *Rust* supports key binding options, which allow players to play instruments with a standard computer keyboard. Second, players can create a folder in the game's files to place their MIDI files in and then use console commands to play the

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[51] "Mordhau Bard Demonstration." Vimeo, 2023.

[52] *Mordhau*, Windows PC Version, Triternion, 2019.

MIDI files whilst at an instrument. Third, a player can connect a MIDI controller and then use that to play associated notes on a given instrument.[53] As with *Mordhau,* playing instruments does not have an effect on any in-game systems, instead the instruments serve as a way for players to express and amuse themselves. However, players do occasionally use the instruments to influence interactions with human players. For example, players employ similar tactics found in *Mordhau* by using the instruments to fool other players into thinking that they are friendly.[54] *Rust* may be one of the most musical games discussed thus far. Despite having a premise that has very little connection to music, *Rust* has ten available instruments that are unrestricted in their regards to rhythm and pitch. Further, the instruments have multiple options for being played so they can be used to play existing compositions or serve as live instruments.[55]

Most of the examples so far have had at least some kind of logic grounding them in their respective games. However, some games include instruments in capacities that are certainly outside the box. Prior to exploring this category, most would not consider instruments when thinking about vehicles. Yet *Donkey Kong Barrel Blast (DKBB)* utilizes instruments as the primary mode of conveyance.

Donkey Kong Barrel Blast (*DKBB)* is a racing game which utilizes various existing and new characters from the Donkey Kong series of games. *DKBB* forgoes the typical racing game conventions of using cars, carts, bikes, boats and so on, instead opting for rocket-powered bongos. All characters, except for King K. Rool, use personalized rocket powered-bongos to race around the tracks. The bongos use motion controls because *DKBB* was released for the Nintendo Wii. Specifically, players need to swing both the Wii remote and the nunchuck in an alternating up and down motion to accelerate. The motion does not need to be continued once a character's

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[53] "The Open Breeze." *Twitch*, 2021.
[54] "The TRUMPET BOY - RUST." *YouTube*, 2019.
[55] *Rust*. Windows PC Version, Facepunch Studios Ltd, 2013.

max speed has been reached. Additionally, swinging just the Wii remote or the nunchuck will steer the character left or right and swinging both in unison will make the character jump. All of these motions come with an associated bongo drum noise from the speaker built into the Wii remote. *DKBB* can be considered musical, but with the caveat that it is very limited. The player only has access to one instrument with the bongos. The player can choose to play rhythmic ideas; however, it should be considered that doing so would draw the player's focus away from the precise control needed to race efficiently.[56]

One can consider using an instrument as a vehicle to be an unlikely application. A similar type of an unlikely utilization can be viewed in the few times in which instruments are used as in-game keys. Keys in video games tend to be non-interactive items that allow players to progress through previously blocked areas. Keys are often designed literally in the sense that they are made to be visually similar to keys or key cards from the real world. Occasionally, games will use more abstract or uncommon things to constitute as keys, such as instruments.

Legend of Zelda: Link's Awakening (*LOZLA*) is a top-down action adventure game and the fourth game in the *Legend of Zelda* series. The game takes place on the mysterious island of Koholint, and the player takes on the role of Link. The primary objective of the game is to return home from Koholint as Link has been shipwrecked and subsequently trapped there. In order to return home, the player must engage in various quests and odd jobs around the island in order to find eight mystical instruments: the Full Moon Cello, Conch Horn, Sea Lily's Bell, Surf Harp, Wind Marimba, Coral Triangle, Organ of the Evening Calm, and Thunder Drum. The instruments are significant as they are the only things able to awaken the "Wind Fish," which is the only entity capable of returning Link back to his proper place. While instruments are not commonly used as keys, their function in *LOZLA* is clearly indicative of a typical key. For

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[56] *Donkey Kong Barrel Blast.* Wii, Paon, 2007.

instance, the player cannot readily interact with instruments once they have been obtained. The instruments will simply take up a visible slot in the player's item menu, but they cannot be played. The instruments only become relevant from a gameplay standpoint once the player needs to gain entry to the Wind Fish's egg, at which point they will all be played together to create an opening in the shell. Keys typically behave the same way: as non-interactable items that linger in a player's inventory until they are needed to gain entry somewhere. As one might expect, the instruments found in LOZLA are not musical. The instruments only play a pre-recorded melody one time upon initially being picked up and once more during the section in which they are all played to gain entry to the Wind Fish's egg. Therefore, the player effectively has no control over the instruments, which means that they cannot be considered musical.[57]

Pokémon Red, Blue, and Yellow (RBY) constitute the first generation of the Pokémon game series. The main draw of the Pokémon game series is the expansive roster of potential monsters to include in one's party and the strategy involved in the opposing typing system. Items are also an important, if overlooked, part of Pokémon games. Certain items are often needed to progress further in the game; some items can make a Pokémon more effective in battle; and some items serve basic utility functions. The Poké Flute is an item that looks like a flute with an attached Pokéball that serves two functions. Primarily, the Poké Flute functions like a traditional video game key. There are two paths in RBY that the player cannot progress past unless they have the Poké Flute. Specifically, there are two instances where a sleeping Snorlax will block a narrow path unless the player uses the Poké Flute to wake them up and battle them. However, the Poké Flute is somewhat unique among traditional keys as it serves some gameplay utility. The player can use the Poké Flute during a battle to wake up any Pokémon that has the sleep status

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[57] The Legend of Zelda: Link's Awakening. Game Boy, Nintendo Entertainment Analysis & Development, 1993.

effect, even an enemy's Pokémon. The Poké Flute can also be used outside of battle to cure a player's Pokémon if it is still asleep after a battle. While the Poké Flute is unique in regards to its functionality as a key, it is nothing special in regards to its use as an in-game instrument. As an instrument, the Poké Flute is very basic considering that it only plays a single pre-recorded melody upon a given usage. Additionally, the Poké Flute needs to be accessed via a menu, so the player's ability to play multiple instances of the melody will be marred with a delay between each instance. Therefore, the Poké Flute is too restrictive to be considered musical.[58]

While the exploration of instruments in games thus far is by no means exhaustive, there is enough material present to begin observing some tentative trends in the ways in which they are typically utilized. The most pressing point to observe is the musicality of the instruments included, or rather, the lack thereof. To clarify, the majority of the observed games do not meet the requirements to be considered musical in regards to the ways in which they handle their instruments. There may be multiple reasons for this outcome. A very obvious reason is that most of the games observed are not focused on music thematically or mechanically. The fact that traditional rhythm games have been excluded from this analysis also contributes to this lack of music focused game options. As a result, the lack of access to robust, musically capable instruments should not come as a surprise. There are outliers, like *Skullgirls* and *Duck Game*, which include musically capable instruments despite being a fighting game and a party action game respectively.

While it is possible to include instruments into games of various genres, the lack of musicality can likely be blamed on developmental constraints. Players would expect instruments to be present in a game like *Guitar Hero,* but why would they expect an instrument to be present, let alone playable, in a game like *Mordhau*? It may be difficult for a game developer to justify

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[58] *Pokémon Red, Blue, And Yellow.* Game Boy, Game Freak, 1998.

the time, money, or energy required to include a playable instrument into a game when there is no guarantee that its inclusion will draw in any potential buyers. Further, the current state of rushed game development within the industry also disincentivizes the inclusion of musically capable instruments outside of music centric games. Large studios regularly rush the creation of games to the point of releasing major titles in various states of unfinished development. For example, *Cyberpunk 2077* and *Battlefield 2042* have been heavily criticized for being unstable at launch due to various bugs and performance issues.[59] With a culture of rushing game development, adding playable instruments purely for player amusement would likely be seen as an unnecessary inclusion.

Another pattern observable in the listed examples is the influence of *D&D*, specifically in the form of the bard. Some games listed have a more subtle influence in regards to *D&D*, but others, like *Baldur's Gate 3,* effectively serve as *D&D* in a video game format. Obviously, the influence of *D&D* on gaming in general is very substantial and is not limited to music- or instrument-centric games. Rather, *D&D*'s influence is felt strongly in this subset of games as a result of the bard class. Many of the listed games, such as *FFXIO* and *EE* make direct references to *D&D* by having character archetypes described directly as bards. It is worth noting that most of these games with bard inclusions do not actually meet the requirements for musicality. Even though bards are meant to be artistically expressive characters, their video game representations likely lack musically expressive options because of their roles as archetypes. To clarify, when a game allows a player to play as a bard, it is very unlikely that the bard is the only thing that player can be. Rather, the bard serves as one of many archetypes for players, like a mage, thief, paladin or so on. Therefore, games with bards typically do not include them as a point of primary

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[59] Hogeweg. "Cyberpunk 2077 Debacle." 2021; Koch. "Battlefield 2042 Is a Buggy Mess at Launch." 2021.

focus which leads to the issue of the previous paragraph. Taking the time to create functional instruments that only a fraction of players will use is likely seen as unnecessary.

Looking towards mechanical functionality, only a single game observed has required the player to play an instrument to progress: *Resident Evil Village* (*REV*). Once again, the player needs to select the keys on a piano in accordance with a piece of sheet music to get a key. This comes with the caveat that playing the instrument is done so in a direct musical way by the player, as opposed to some abstraction, like pressing an attack button which then makes a character strum their guitar and damage enemies. It seems that the majority of games which include instruments clearly meant for player expression use them for nonessential purposes. To specify, the instruments are nonessential in the sense that they do contribute to any core gameplay functionalities; instead, the function of most playable in-game instruments is to amuse the player simply by virtue of their inclusion. It is possible that games shy away from making instrument playing essential because of the difficulty that it might cause players. For example, even a relatively easy piece of music can be difficult to play for a person who does not have the ability to play music. One can even see this in the *REV* example, as it has been designed in such a way that a player can simply brute force the puzzle. Since the player does not need to play the notes on the sheet music in a perfect sequence, they can continually just press keys until they get the right note for the section they are at. If the puzzle were designed more strictly, players might get frustrated at having their progression impeded by a lack of knowledge for music reading that they feel is not relevant to the overall game.

The inclusion of instruments in video games is a diverse subject. Instruments are added to games for a wide variety of reasons and their inclusion can be almost entirely inconsequential or they can have a relevant impact on the games in which they are featured. Generally, instruments

are included for aesthetic purposes. Weapons, equipment, environmental design and so on are the most common ways that instruments find themselves in games. Most of the instruments included in this fashion are aesthetic because if they were to be replaced with another asset, then they would be functionally similar or the same. Rather, the developer has intentionally chosen to make these assets instruments to convey some meaning. In *Metro 2033: Redux*, the guitar in the players room could just as easily be replaced with a shelf or a chair. However, the guitar is much more effective at conveying the comfort or coziness of the space. Occasionally, games include instruments with enough capacity for interactivity or expression that they become truly unique. For example, something would be lost if the instruments from *Duck Game* were replaced with alternative physics objects. Playing the instruments does not provide a gameplay benefit, but the capacity for player expression does add something to the game that would be difficult to replace. It is very likely that instruments will continue to remain a relevant component of human culture and will therefore remain a consistent inclusion in video games. Most future inclusions will likely remain fairly simple, but every so often a game will take on the task of including novel and interactive instruments in its world.

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