

AI Companions, Steering, Game Win States... & You!

By

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1 Introduction

The main objective of this project was to experiment with certain narrative tropes in video games as well as player attachment to Non-Player Characters. I used some AI behaviour states and group steering to make AI followers that were able to follow the player in a sufficiently satisfying way. To test player attachment to these AI's I made several levels to test players reactions to them in different scenarios. I timed players speed at running through the levels with and without the AI followers, and although I won't be doing a full statistical / psycho-social analysis of the results, they seem to be naively pointing towards players caring for their AI companions.

2 Background

Ask anyone that has played enough video games and you'll soon find out that AI companions in games are a thing of mixed feelings to say the least. Escort missions are pretty generally hated (for good reason), and certain games that try to make AI companions that we really care about end up just being annoying (*Resident Evil 4* for example). The way that AI companions are handled within games is a major contributing factor to my interest in the experiments in this project. Many common narrative tropes such as resets that don't affect gameplay after doing something "wrong" associated with these companions also led to my interest in further exploring this topic. In addition I've also briefly looked into some other narrative commonalities in video games that are less related to AI companions.

Companion's have also been used in many games in very positive ways: *Ico*, *Fable 2*, *Shelter*, and *The Walking Dead* just to name a few. All of these games set out with the intent of making a character whose fate is linked to the player, but not directly controlled by them. These games are all also trying their darndest to make players care deeply about these Non-Player Characters. In general these games all succeed at those goals. Most of these games use in game rules to try and bolster the relationship between the player and their companion. In *Fable 2* your dog companion helps out in fights and searches for treasure to give to you, in *Shelter* if all of your pups die you're awarded a game over screen and in *Ico* Yorda (the AI Companion) helps the player by opening passageways and being necessary to solve certain puzzles. A common problem with this technique is that these companions can easily become objectified in this way. Peter Douglas McDonald notes in his paper on *Ico* that "Yorda becomes associated with utility; she is objectified as necessary to open doors and progress." (1) Although (as McDonald goes on to discuss) *Ico* does effectively use this to further the relation between the player and Yorda, I feel like the problem with many companions in games stems from them being too much mechanics, and not enough feels. In both *Shelter* and *Ico* your life is linked to that of your companions, if they die it's as good as you dieing in the eyes of the game rules. Though this can theoretically be used as a metaphor for the deepness of dependence between the player and the companion I find that it tends to just be viewed as annoying and if anything lessens that bond. In *Fable 2* your dog is useful to the point where it can be confused for a very effective stat boost. Players tend to make close bonds to the companions in these games, but sometimes it's in spite of these mechanics as opposed to being caused by them. In this experiment I wanted to

make players care as much as possible without ever telling them, or giving them any reason to do so. *The Walking Dead* is a great example of this, and a large inspiration for this project. Early on in *The Walking Dead* you encounter a young girl who for all intensive purposes does nothing for you in the game. You take her on as a companion and are consistently presented with decisions that revolve around her without objectifying her as some fancy tool for the player to use. For example at one point the player is presented with the opportunity to loot a car. The owner of the car is almost definitely dead, so you wouldn't really be stealing from anyone. The girl companion though (as the naive child that she is) doesn't want to loot the car in the case that the owner is still alive, she thinks that it's not ok to potentially be stealing from this person. These supplies, in the dystopian world where this game takes place, might mean the difference between life and death and the only reason that you wouldn't steal it is because you might hurt the feelings of your AI companion. Many people decide to not loot the car, that's exactly what I'm looking to try and make happen with these experiments.

Another thing that I wanted to address with this project were some common narrative decisions made in games. Primarily I experimented with win states and players reactions to them. Video games are still very young in their development as an artform and still have a long way to go. The idea of a win state is very interesting to me. Video games are games, and games tend to have win states, but this really fits more into the properties of competitive games. Does an open world game, or even a narrative centered game necessitate the use of a "win state"? Win states can definitely contextualize a game, and add plenty of meaning to it, but maybe the lack of one or unimportance of one can add just as much meaning to a game. In a paper discussing the construction of modern game narratives Verbrugge briefly defines pointlessness as "the possibility of the game persisting after the player has performed actions that make the game as a whole unwinnable" (2) and claims that it is an undesirable property. If the main progress and fun of a certain game is measured by unlocking clever, well written, and enjoyable text snippets why should the last text snippet that you see in a playthrough be labeled as desirable or undesirable solely based on whether or not its last words are "you win" or "you lose". In both cases you still get an ending to the story in an interesting, well written way. Why should the ability to reach a positive win state be tied into the quality of a game? Is *Romeo & Juliet* a worse play because the two lovers die in the end? This is most definitely not a positive win state, but it is how the play ends. If a game doesn't have positive ending state is that a bad thing? I was inspired by the questions that this brought up to look further into how win states contextualize game play, and to see what I needed to do to get players to disagree with what the game is telling them to do and to instead define their own win state in a way that was most satisfying to them.

3 Methodology

In this project I worked with making companion AI's that the player would hopefully care about without ever being told to do so explicitly by the game. I also briefly experimented with win states and the desire of players to reach them versus their desire to have / create their own fun in a game.

3.1 Steering Methods:

To make AI followers that a player cared about I needed to work with some steering methods. To make the AI's follow the player in a sufficiently satisfying way they used state behaviors to choose what to do at any given moment. Most of the time the AI's do their best to move towards a point some distance behind the player character. AI followers have slightly randomized attributes which leads to a more interesting group dynamic (if they had the same attributes most of the time it would look like a single follower). I decided to make AI's not collide with each other, tightly packed groups when close to the player look really satisfying. Some other noteworthy behaviors of the AI's in regards to their following is what they do when they can't reach the player. If AI's find that they are making no progress towards the player in the x axis they will sometimes go in the "wrong" direction for some time to see if this gets them out of some sort of rut. AI's will also attempt to match their y positions with the player by jumping with them. The AI's also try their best to self preserve in the face of danger. When near cliffs, with a big enough falls off of them the AI's will work harder to jump optimally off of them as opposed to blindly following player jumps.

3.2 Follower Aesthetics:

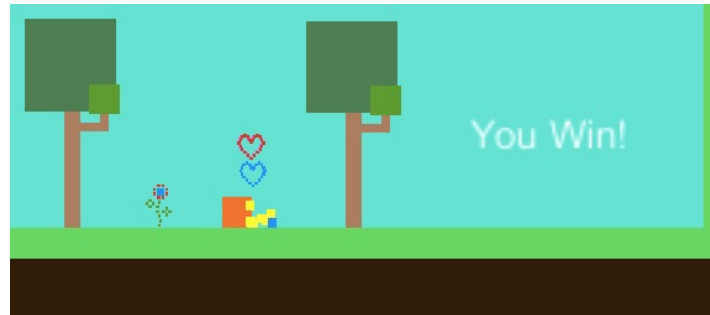
In addition to making the AI followers able to follow the player I needed to make them aesthetically pleasing enough to encourage players caring about them. The first thing that I did in this direction was to make them hop around randomly while they feel safe around/following the player. The AI's tendency to try and jump when the player jumps (while also being a mode of steering) was also implemented to try and give a sense that they were trying their best to imitate the player, which is often regarded as a high form of flattery. Similarly if the player is on a higher block the followers will do their best to try and jump up there over and over again. Finally if the player and followers are idle for long enough while close together hearts will start to spawn above the heads of the followers.

3.3 Levels:

I made several levels, detailed below, for testing player care towards the AI's as well as their reactions to different win states. I had people play through some of the levels with and without AI followers recording their time and responses to different levels / situations. It's important to note that in all of the levels there are no instructions for how to win the level. Only signs pointing towards win states, and signs that signify having won the game (they say "You Win!").

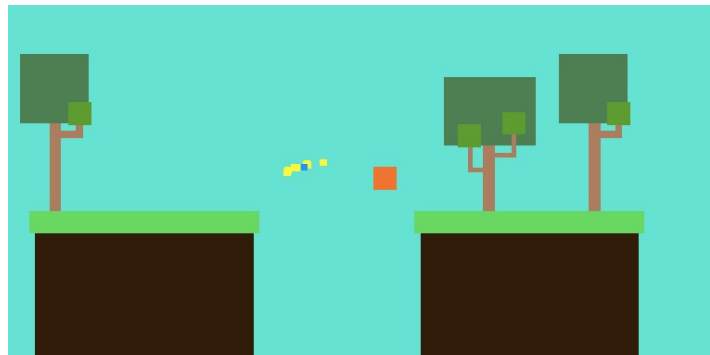
Basic Walking Level: The basic walking level is just a flat world in which the player can walk left or right. The player is spawned on the leftmost side of the level and there is a win state at the rightmost point. This level was intended to see how players would react to the AI's in a relatively sterile environment.

Figure 3.a. Screenshot of the basic walking level



Gap Level: This level is similar to the basic walking level in structure, but is peppered with mario esq infinite gaps throughout the level. These gaps increase in size as they get closer to the right side of the map (the win state). AI followers are able to follow the player jumping over the first several gaps without harm, but as they widen the followers start not being able to make the jumps. This level was intended to see how far players would go while seeing their followers die because of actions that the player was directly in control of. It was also intended to see if players would disregard the win state in preference for their followers.

Figure 3.b. Screenshot from the gap level



Elevator Level: In the Elevator Level players would move to the right until approaching an elevator. The elevator brought them down into a cave with a sign pointing to the left (deeper into the cave) claiming that a win state was in that direction. Moving to the left the player encounters a block that is too high for AI's to jump over. This is supposed to be a choosing point where players decide whether or not to continue into the dark, cold loneliness of the cave without their followers (but towards the win state) or not. To the right (and purposefully unmarked) is slightly more cave followed by an exit out onto a field. This field goes on forever towards the right,

dynamically generating more ground, trees, bushes and flowers as the player moves further rightward. It's worth noting that the field is bright and feels much happier than the dark, lonely inside of the cave. This level was for testing how players would react to their followers not being able to follow them. I wanted to see what players would try to do when presented this decision. It was also an experiment with game defined versus user defined win states. These states are purposefully mutually exclusive. The player must choose between getting the game defined win state, or being with their followers indefinitely. A bright happy meadow that you can hop around in with AI companions for an eternity would generally be considered more positive than a dark and lonely cave, but if that lonely boring cave has a cherished game defined win state in it it might just be too appealing for players to leave it be.

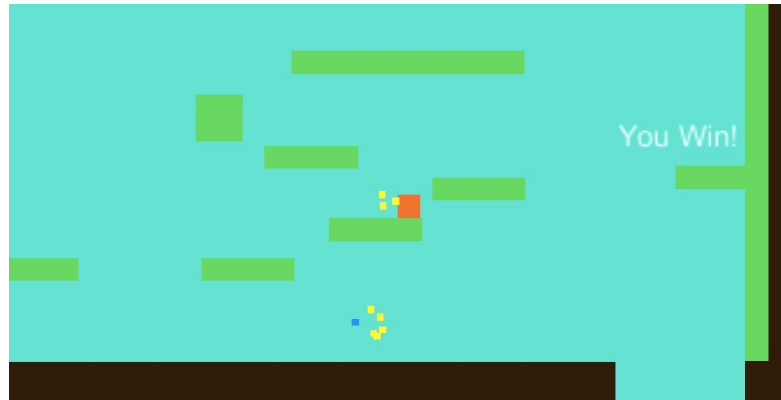
Figure 3.c. Screenshots of significant parts of the elevator level



Platforming Level: This level is very similar to the basic walking stage as well, but at the right hand side of the map the win state can only be reached by jumping on some platforms leading up to it. These platforms are trivial to traverse by the player alone. Having your followers traverse them with you is another story though. Accomplishing this is nearly impossible. The platforms are just above some ground, so the player is free to fail and retry as many times as they please. There is one exception though. Under the win state platform is a gap in the level itself. If the player jumps onto win state platform with their followers trying to reach him/her from below they will ultimately fall into the gap and die. The point of this level was to see how players would react to a situation that seemingly allowed them to attain the game defined win state with all of their companions, albeit with some added difficulty. Note that the win states here aren't mutually

exclusive. Players can still get to the game defined end state while accomplishing a personal goal of bringing their followers with them to the end state. I wanted to see if having explicit win states able to be completed in association with possible (obvious) personal goals would increase players attempts to reach the implicit goals.

Figure 3.d. Screen shot of the end of the platform level



4 Results

To do some experimenting I had players play the game and noted in game and out of game responses to different stimuli. On some levels I also timed how long it took players with and without AI companions to reach the game defined win state. I don't think that I was able to get enough volunteers for these results to necessarily be significant, and on top of that I feel like the experimental design wasn't exactly where I wanted it to be. To get really convincing results would require a well-defined and properly controlled human study, which is a non-trivial undertaking outside of the scope of this project. Despite that the results that I did get from my test players were interesting and in my opinion still worth discussing.

4.1 Basic Walking Level Responses:

I didn't bother to gather any hard data on this level, but did still have several players try this level with and without AI companions. Players with AI companions were slightly more likely to stop in the middle of the level and experiment with how the companions followed them. In the end though this level doesn't present a conflict between internal (motivation that the player must define themselves, such as caring for the AI followers) and external motivation (game defined win states), which is probably why it was hard to recognize any significant difference in behavior.

4.2 Gap Level Responses:

This level seemed to also fall short in terms of results, likely due to its lack of reasonable choices that players could make. Players would jump over the gaps moving towards the right and eventually would come across a gap that not all of their companions could jump over. The best reactions noted on this level were probably player out of game reactions to their AI's dying. Many, but not all, players would seem surprised and some would try to ask the test giver if they had done something wrong. Beyond these responses though nothing measurable was really found. It seems like the lack of viable choices led players to just move forward. In addition after the initial death of a few of their companions players seemed to deem it worth to just keep moving forward. There are probably several problems with the design of this level, but the two most obvious ones to me are the lack of choices to be made and the lack of bonding experiences available to players in the level. The only choice that a player has is to move right, or stop progressing and essentially not play the game. For most people not playing the game doesn't seem like a viable choice to make while inside of a game. In addition, a lack of time / sufficient experiences to bond with the companions in this level probably led to the more heartless reactions by these players.

4.3 Elevator Level Responses:

The elevator level with slightly more deep design seemed to encourage more obvious reactions from the players. Due to the more immediate and visible reactions I chose this as one of the levels that I tested further than some qualitative analysis of a few players. In Figure 4.a you can find results of players run time through the level without AI companions versus the run time with AI companions. Though there are only 7 data points for runs without companions, and 8 for runs with them there seems to be a definite notable trend between the two types of run throughs. Players with AI companions take longer to achieve the game defined win state. The majority of the extra time spent by these players was around the block that the followers couldn't jump over. Players would try to interact with the followers in an attempt to possibly teach them how to jump correctly. Others would try to help by leading the AI's into a running start before the jump. There were several other in game responses by players to this situation, the vast majority of which were directly related with trying to some way help the followers over the jump. These results at least naively point heavily to player care about their followers despite not being told to. Players were willing to sacrifice time getting to the end state in an attempt to bring their companions with them.

The data in Figure 4.a and discussed above all had no instruction towards the player from the test giver. In contrast for several tests the test players were given some brief instructions. The test giver would tell them that: when they are standing under the words "You Win!" that they have reached a win state, and that they were being timed through the run. This set of data had extremely different results from the results with no instructions before a run through. As shown in Figure 4.b players seemed to more or less disregard the fact that they had companions when given instructions. This seems like it might have some interesting implications about win states being more heavily imposed upon players.

A final interesting point to note on this level is that three players (out of the 8 non-instruction players with companion run throughs) explored the meadow briefly. Of those three, only one refused to finish the level and instead decided to stay in the field indefinitely. Despite players tendency to take longer with companions the lack of any ability to actually do anything about bringing them to the win state seemed to eventually discourage players enough that they would leave the companions behind, preferring the game defined win state over all else. Players seem to prefer (or at the very least have been conditioned to prefer) being told that they've won over having a potentially more aesthetically pleasing experience without external motivation.

4.4 Platforming Level Responses:

This level, like the previous one tended to illicit more obvious responses from players, and thus was also a larger focus of this study. Figure 4.c shows the difference in run time between players with and without AI companions. Note that there is a significantly larger difference between the two groups for this level than in the previous Figures. The longer amount of play time for players with AI companions can likely be attributed to player attachment to the AI's (like in 4.a). The large difference between the results of this level versus those of the elevator shown in 4.a can possibly be attributed to several probably non-mutually exclusive factors. The first one being that players, in this level, get a higher chance to bond with their companions. In the elevator level the AI companions only have a chance at winning players hearts by being cute and acting somewhat distressed when the player starts to leave them. In this level however players have the opportunity to work harder and have most of their companions follow them through some of the platforming part of the level. This allows players to potentially feel like their work is actually paying off, and therefore have a better chance of bonding with their companions. Secondly players' internal motivations are more likely to line up somewhat with the game defined win states in this level. The most obvious implicit goal in this level is to bring the companions with you to the win state instead of just getting there alone. There is no direct conflict between the external motivation given by the game and the obvious implicit goal (this was not the case in the elevator level). Finally it's definitely more challenging, and seemingly more fun, to try and bring the companions with you to the win state in this level. Traversing the platforms by yourself is a trivial, and boring task, but trying to bring the companions with you quickly becomes an interesting challenge. At this level of study it's impossible to really say which, if any, of these things are actually happening or causing the differences seen in the data. Despite that the numbers seem to indicate of something interesting happening when players are exposed to the AI followers.

Another brief note on win states here. After enough time without being able to get their companions to follow them, players would eventually give up and move to the win state location (recall that this leads in the death of all companion AI's that aren't on the win platform with the player).

Figure 4.a

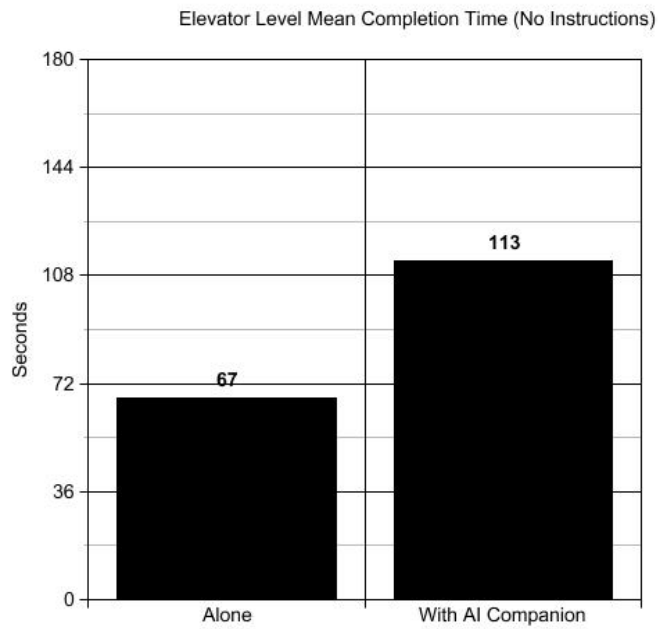


Figure 4.b

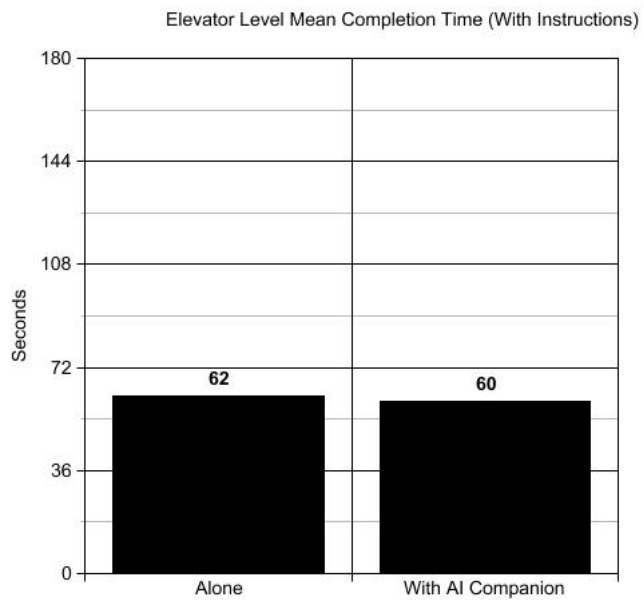
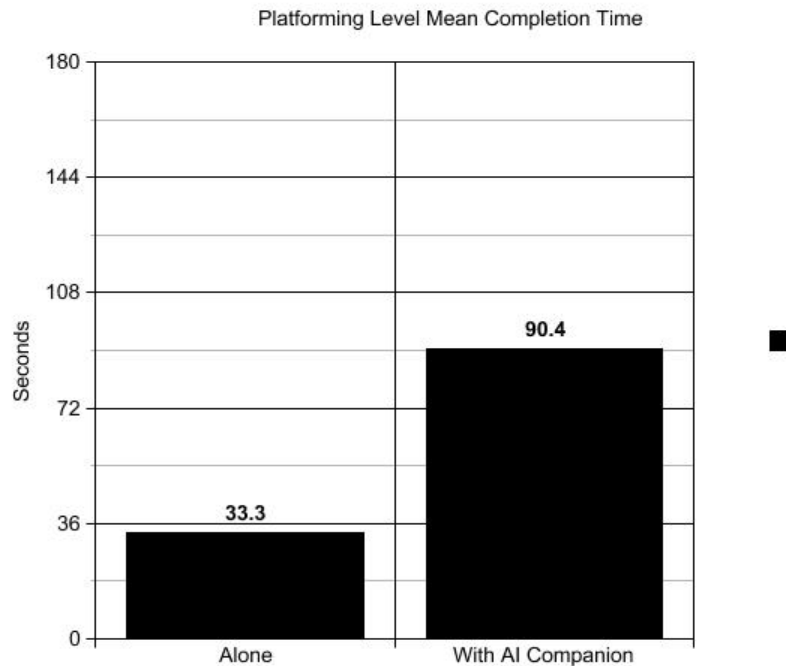


Figure 4.c



5 Conclusions / Future Work

The conclusions to this project and rudimentary study were really interesting to me. It seems like players are extremely willing to care about AI companions relatively quickly and easily. Players will often go out of their way in an attempt to bring followers along with them even when it's relatively obvious that their efforts are in vain. This trend of players going out of their way to bring AI companions with them without being told to seems to only get stronger with an increased feeling of being able potentially to accomplish it. Ultimately though win states seem to win out. They seem to mold how players play and experience games to an extremely large degree. Players would rather get some text on the screen saying that they've done a good job than spending indefinite time with their AI companions. In some levels players were presented the choice of getting a win state at the cost of all of their AI companions dying. Players almost exclusively chose the games win state after enough time.

If I were to do future work on this project I would work mostly on improving three main aspects of it. Firstly I would want to make more experimental levels in an attempt to test players in more interesting ways. Secondly I feel like adding some more feedback associated with the AI companions could go a long way to immediately increase player attachment. The first step that I

can think of is adding sounds. Happy, cute sounds (designed specifically to not be too annoying) for when companion AI's are safely near the player could go a really long way. In addition distressed sounds when AI companions have lost their way, or are being left behind by the player seem like they could have a great effect on players as well. Thirdly given more time and resources, I would really like to make a more properly controlled study on test players. More people reacting in more controlled environments could add much more understanding as to what is happening. More closely noting and studying player in and out of game reactions and behavior could potentially help in pointing towards the reasons behind these numerical anomalies found in this brief study.

6 References

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