Using Level Design Strategies to Create Useful NPC Companions That Provide Effective Gameplay Value to the Player – A Postmortem

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I. INTRODUCTION

Many games these days feature companion characters that occupy the same space as the player. However, execution varies in effectiveness, and some examples come across as ineffective or too overbearing to the player, negatively impacting their experience. The purpose of this project is to identify best practices of using level scenarios and gameplay to create a consistently effective NPC Companion and improve player experience. For the purpose of clarity, effective will be defined as 'successful in producing a desired or intended result, and fulfilling a specified function[1]'. In this case, an effective NPC companion helps a player progress through a quest and helps them overcome obstacles without negatively impacting the player experience.

II. HIGH-CONCEPT GUIDELINES

Several high concept guidelines were used to support and supplement the topic, explaining player motivations that lead to positive feedback in regards to whether an NPC companion can be successfully implemented or not. Since this topic deals with the relationship between two subjects (player and companion), the guidelines must balance the factors of both the player and the companion to achieve effectiveness in the eyes of the player.

A. Self-Determination Theory

The Self-Determination Theory posits that there exists three major needs that fuel people's motivations: Competence, Relatedness, and Autonomy. I have taken these three needs and interpreted them to fit within the context of the topic. They are as follows:

1) Competence

Competence refers to the individual's desire to feel powerful and impactful in their goals. Player Competence is the idea that players want to feel powerful, that they can accomplish tasks at a high level. Players desire the feeling of accomplishment and want to feel that their skills lead to the successful execution of tasks and goals.

NPC Competence refers to how powerful the player's companion is in relation to the world and situation. An effective companion should be competent enough to complete tasks on their own, but not interfere with the player's own sense of competence. Thus, a balance needs to be achieved between Player Competence and NPC Competence to create the ideal player experience.

2) Relatedness

Relatedness is the idea that the elements of a world belong in the world. In the case of the player and their companion, I have interpreted relatedness to be the interactions and resulting relationship between the player and the NPC companion character. An effective NPC companion constantly interacts with the player character in a positive or helpful manner, augmenting the other tenets of player motivations (competence and autonomy for both the player and NPC). Likewise, the player discovers how they and the NPC both fit into the world.

Communication is a strong tool that can help support relatedness. The Interacting Mind Project theorizes that communication is essential to effective teamwork, as well as perceived competence between team members of each other's abilities. If a team perceives team members to be incompetent, or if a team works together with no communication, a team will not think that their teamwork is effective.

3) Autonomy

Autonomy refers mainly to the individual's desire for freedom, to leave an impact on the world and be acknowledged. Players want to feel like they are in control of their own choices and their own destiny. In the artifact, Player Autonomy refers to the player's control over the pacing, progression, and outcome of the level.

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[1] Dictionary.com

NPC Autonomy is the illusion of choice perpetuated by the NPC character in the context of the world of the level. Choices made by the NPC in reaction to the player's actions and level events all contribute to the idea that the NPC is interacting with the world and making decisions along the way as well. This need relies on the player perceiving the NPC's actions as autonomous, making it reliant on a player's situational awareness.

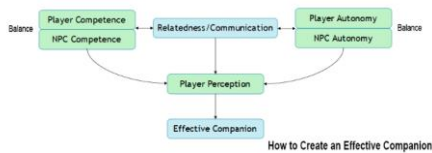### III. APPLYING GUIDELINES TO ARTIFACT

Figure 1: Guideline flow chart

The above chart highlights the many elements that must come together to create an 'effective companion'. In addition to cohesion between competency balances, autonomy balances, and relatedness/communication, player perception is required to convey the elements of effective companions to the player.

Due to the format of the player experience, player perception is vital to the determination of whether an NPC companion is 'effective'. If an NPC companion is competent, can interact with the player, and has moments of autonomy scripted into scenarios, players can still perceive the companion to be 'ineffective' if they do not see or register the companion's actions during gameplay. Likewise, a player can experience intended scenarios with the companion and still have a negative perception of the companion due to bugs or unsuccessful scenarios, so ultimately player perception serves as the gateway between the high concept guidelines and a truly 'effective' companion

IV. THE SCENARIOS

After establishing guidelines based on player motivations, I created a list of individual scenarios that address one or more points listed in the guidelines. As the artifact developed, it became a challenge to consistently pace the scenarios in a way that would positively affect player response; certain areas were more empty than others, causing down time that made the player more aware of the companion's interaction limits.

Both the level maps (Figure 3) and corresponding table of scenarios (Figure 4) are located below:
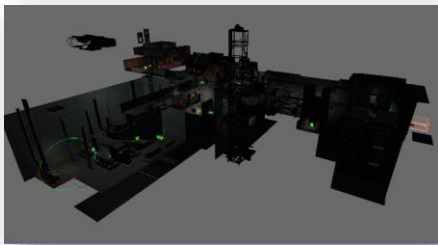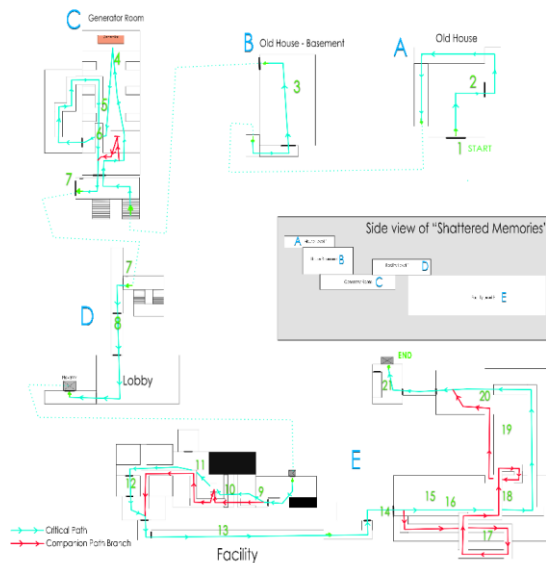

Figure 2: Perspective shot of map

Figure 3: Top-down map with scenarios

#	Scenario	Player Competence	NPC Competence	Relatedness/Communication	Player Autonomy	NPC Autonomy
1	INTRO			ESTABLISH INITIAL GOAL		NPC WANTS HELP
2	Locked Door - Old House	PATH CREATION (or)	PATH CREATION (or)	FIGURE OUT WHO PICKS LOCK	CHOICE – WHO OPENS DOOR	
3	Battle - Ghouls	COMBAT	COMBAT	COMBAT SUPPORT		
4	High Ground as player activates generator- Gen Room	COMBAT	HIGH GROUND SUPPORT		TURN ON LIGHTS	
5	NPC extends bridge - Gen Room		PATH CREATION			
6	NPC gives player stimpaks		NPC GIVES HEALTH	NPC HELPS PLAYER		DECISION TO HELP
7	Terminal Hack - Stairs Player and NPC Dialogue Interaction	CHANGE TACTICS	HACK/PATH CREATION	COMMUNICATION	DIALOGUE CHOICE	
8	Mr. Handy scene	PERSUASION			DIALOGUE CHOICE	
9	Player extends bridge - Storage Room	PATH CREATION		LEAP FROG		
10	NPC activates conveyer belt - Storage Room		PATH CREATION	LEAP FROG	N/A	
11	Storage Room Battle - Gunners	COMBAT	COMBAT	COMBAT SUPPORT		
12	Gas Room Scene		SAVE PLAYER	NPC RESCUES PLAYER	PLAYER TRAPPED	DECISION TO SAVE PLAYER
13	Long Hallway Battle - Gunners	COMBAT	COMBAT	COMBAT SUPPORT		
14	Terminal Hack - Before Cat Room		PATH CREATION			
15	Cat Room Battle - Gunners	COMBAT	COMBAT	COMBAT SUPPORT	COMBAT FREEDOM	NPC INITIATES PUSH
16	Player presses button - Cat Room	PATH CREATION		LEAD FROG		
17	Gunners charge NPC - Cat Room	COMBAT		PLAYER ASSISTS NPC	PLAYER DECIDES TO HELP	
18	Terminal Hack – Cat Room		PATH CREATION	LEAP FROG		
19	Dual catwalk advance (NPC and player)	COMBAT	COMBAT	PLAYER COVERS NPC		NPC INITIATES PUSH
20	NPC lowers ramp for player	COMBAT	PATH CREATION	PLAYER COVERS NPC	PLAYER HELPS NPC	
21	Lucas Confrontation			COMBAT SUPPORT	FINAL CHOICE	

Figure 2: Table of Scenarios

V. SCENARIO OBSERVATIONS AND CHANGES

I collected data from 11 playtesters using ~~an~~a post-game in-person interview in addition to an online survey. This data was compiled into notes, and I asked playtesters to gauge their feelings towards different aspects of the scenarios with Likert scale and short-answer questions.

The Generator Room sequence (Scenario 4~~)~~, Gas Room scene (Scenario 12), and Catwalk Room (Scenarios 15 – 20) garnered the strongest positive responses from playtesters, with 6 of 11 playtesters

naming the catwalk room as the place where they experienced the strongest positive response towards the companion. These scenarios suggest that clear conveyance regarding the companion's position and status towards the player help improve player reception.

These rooms (containing several scenarios each) share several commonalities. The first commonality is a clear presentation of events as perceived by players. In the Catwalk Room and Generator Room, the space is laid out in a way where players have constant visual access to the companion. Players understand their role in the space, what they must do, and how the companion factors into it. Compare this to the Storage Room (a less successful room), where players had a difficult time discerning the companion's actions in the space due to less effective layout planning (the companion moves on a catwalk above the player. The player needs to look up to see what's happening, increasing the number of steps required to clearly perceive the companion's actions.

Another commonality is the balance of both player and NPC competence. As seen in the Table of Scenarios (Figure 4), both the Generator Room and Catwalk Room feature many opportunities for players and NPCs to display competence. If competence is too skewed in favor of the companion, players can end up feeling dissatisfied with their own performance, affecting their perception of companion effectiveness and ability to positively assess the situation they are in. For example, the Catwalk Room (Scenarios 15-20) used to be extremely tough for the player, adversely affecting the perception of their own competence. After modifying the level to increase player competence (more cover, flammable barrels for burst damage, a minigun), 6 of 11 playtesters cited the Catwalk Room as their favorite example of strong progression and teamwork with their companion, even though the companion herself maintained the same level of competence. Other areas with positive playtest reactions include the Long Hallway battle (Scenario 13) and initial Ghoul battle (Scenario 3), both of which feature ample opportunities for the player to feel competent, which affects their sense of autonomy and how they interact with their companion (relatedness).

Further playtesting revealed players' innate desires for more relatedness in the form of communication with the companion. Players consistently asked for more opportunities to initiate communication with their companion in the form of dialogue choices, which touches upon relatedness as well as autonomy. Thus, as the artifact developed, more opportunities to initiate and direct companion conversations were added. The most direct example of this implementation is the 'constant dialogue' option, where players can initiate dialogue with their companion at any given point in the quest to evaluate their tactical options and inquire about the companion's status. This option helps give the player more autonomy in their relatedness, which feeds into their own sense of competence (through changing tactics and parsing info in the dialogue).

VI. CONCLUSION

To recap, many interweaving factors form the basis of a gameplay-effective companion. These elements include the balance of player competence and NPC competence, a steady diet of player autonomy that ~~impact~~ impacts player competence and relatedness, and constant interactions with the companion whether through ~~interative~~interactive dialogue or non-verbal interactions (such as opening paths).

Playtesters have expressed their desire to have nuanced communication options with their companion character where the companion can demonstrate autonomy by reacting to the events surrounding her. To this end, I still need to add more nuances to the dialogue (specifically dialogue that highlights the companion reacting to events changed by the player) to further increase player favorability and achieve this autonomy.

Other factors can also impede the effectiveness of the character, including level pacing and the conveyance of the companion character's actions. If the level is paced poorly or if the player does not know what to look at, that can reflect negatively on the companion character because the companion is also a part of the level. Therefore, it is important to mitigate unintended consequences that can negatively affect player perception by tightening pacing and removing level down-time and chances for the companion to behave in unintended ways (by increasing frequency of level scenarios or decreasing size of space between scenarios).

For future research, developers can use a gameplay-effective companion character as the starting point to create ~~a companion that have~~a companion that has good potential for emotional connection. From the playtest data I collected in my survey, players' emotional connections towards the character vary (3.55 average on Likert scale with average deviation of 1.68) more than their perception of the character as gameplay-effective (4.81 on Likert scale with average deviation of 1.32), since emotional connection hinges on other variables such as player expectations, backstory/context, character motivations, and player motivations. Combining a gameplay effective character with these other elements (which lean towards more traditional storytelling means) could lead to a truly impactful companion character. Ultimately, to create a gameplay-effective character, it is important to

balance the factors of competence, relatedness, and autonomy when designing the level.