Marshmallows and Bullets[1]

A few years ago, a commercial for the Kinder Surprise chocolate egg aired on German television. In it, a girl sits at an empty table in a room otherwise devoid of furniture or decoration, with the exception of a flip chart. A young woman hands the girl a chocolate egg and gives the following instructions: "This surprise egg is for you and, if you don't open it until I come back, you'll get a second one." As the woman speaks, the viewer sees several takes of different children, showing that the pretend experiment was conducted many times with different "subjects." This ad produced by the German advertising agency Zum Goldenen Hirschen is called DER NEUGIER-TEST (The Curiosity Test) (Zum Goldenen Hirschen n.d.). The Kinder Surprise eggs are known for hiding a trinket inside—the surprise—that kids obtain when they eat the chocolate. The commercial continues as it offers the viewer a manifold display of anxious behavior: one youngster stares at the egg with a furrowed brow; another shakes it near her ear and looks at the camera with innocent eyes; a third hides under the table, comes back up slowly, takes a short peek at the egg, and immediately hides under the table again; a fourth one grabs her head and gives the camera an uneasy look. In the end, as expected, they cave to temptation and sink their teeth into the delicious treat. The commercial ends with the slogan "Na, Neugierig?"—which roughly translates to "well, curious?"—displayed in colorful font. What the question seems to imply is that the kids opened the candy and ate it to find out what kind of toy was hiding inside, emphasizing the Kinder egg "surprise" instead of the fact that kids love chocolate—or almost any food rich in sugar and fats. While curiosity might have enhanced the appeal of the chocolate

1 An earlier version of this section was published in the anthology CLASH OF REALITIES 2015/16. ON THE ART, TECHNOLOGY, AND THEORY OF DIGITAL GAMES (Alvarez Igarzábal 2017b).

egg, any type of candy—with or without a surprise—would have likely done the trick.

In fact, marshmallows accomplished the very same feat a few decades ago. DER NEUGIER-TEST was actually mimicking a famed longitudinal study started by psychologist Walter Mischel and coworkers in the late 1960s and early 1970s known as the Marshmallow Test (Mischel et al. 1970; 1972; 1988; 1989), which spanned for many decades with several different measurements.

The experiment proceeded in a very similar way to the commercial. The children sat alone at a table in a room and one of the researchers gave them a treat with almost the same guidelines: the children had the choice to either eat the treat right away, or to wait for the adult to come back without eating it, in which case they would get a second one. In some cases, these treats were marshmallows, hence the name of the study. But the children could, in fact, choose one of several options, including marshmallows, cookies, or pretzels (Mischel et al. 1970, p. 332; 1972, p. 207; 2014, p. 17). They could also call the researcher back by ringing a bell, which would also deny them the possibility of a second treat. The experiment was carried out (with variations) over the course of several years with over 500 children ages four and five. While the researcher was away, the kids were either directly observed or filmed. Once again, just like in the commercial, the kids used different strategies to pass the time and resist eating the treat that was handed to them. But here is where the similarities between the streamlined portrayal of the commercial and the results of impartial scientific practice start to wane: while some kids ate the treat right away or at some point before the researcher came back, others were able to accomplish the task at hand and received the promised reward. That is, some kids could delay the pleasure produced by eating a marshmallow (or cookie or pretzel) and tolerate the unpleasant feeling produced by this postponement in favor of a future, superior benefit. What Mischel and his colleagues were studying was self-control. They wanted to understand how it works and how it manifests in behavior.

The tests with preschoolers were just the first stage of Mischel's long-term study. A dozen years later around one hundred of the 500 children who took part in the experiment were tested again. This time, the researchers looked at their performance in school and asked their parents to judge their child's social and academic skills. The researchers discovered that the children who performed best in the Marshmallow Test tended to perform better in school and earned a more positive judgment of their skills from their parents. These results showed that the Marshmallow Test could, to some degree, predict a child's success in school and

their social environment later in life (Mischel et al. 1988; Mischel 2014, pp. 23-24).

It should be noted, as Wittmann (2012, p. 15) points out in his assessment of the experiment, that a look at the original data shows that the connection between the early test results and the later adolescent performance in school and social life is at best moderate. Several other factors also contribute to the development of social and academic skills. Nonetheless, Wittmann continues, the correlation stands: the kids who waited longer for the adult to come back with the second marshmallow were more likely to perform better in school and their social lives in adolescence. The ability to voluntarily postpone gratification in favor of a better, deferred reward is therefore a key aptitude for goal-oriented decision making.

To better understand these results, it helps to think again of time as a landscape. Not only can we travel through it at different speeds, but we can also look ahead and behind us. Thus, time can be said to have perspective. Zimbardo and Boyd, following Kurt Lewin (1951), have defined time perspective (TP) as follows:

> "TP is the often nonconscious process whereby the continual flow of personal and social experiences are assigned to temporal categories, or time frames, that help to give order, coherence, and meaning to those events […] Between the abstract, psychological constructions of prior past and anticipated future events lies the concrete, empirically centered representation of the present" (Zimbardo and Boyd 1999, p. 1271).

Time perspective is, simply put, the process of organizing the continual flow of life into three temporal frames: past, present, and future. Of those three categories, two are top-down, *off-line* constructions of events—the remembered past and the conjectured future—and one is (partly) bottom-up, *online* sensory perception—our awareness of the present status of the environment. But our attention is not always evenly distributed between these three temporal categories. Some might emphasize the future over the present and the past, or the past over the present and the future. These temporal biases have a significant impact on our decision-making process (ibid., p. 1272). The more future-oriented one person is, the better they will be at self-control. Present-oriented minds will rather seize the moment without giving future consequences too much thought. Past-oriented people tend to revert to bygone days, surrendering to nostalgic tendencies.

Present-oriented decision making is what psychologists also call temporal myopia (Wittmann 2012, p. 16). We all have temporal myopia to some degree,

since, all other things being equal, we would rather obtain a particular benefit right now (say, 50 dollars) than at some point in the future. We would even take a slightly smaller benefit now (45 dollars) than a slightly larger one in the future (50 dollars), as shown by a study conducted by Gregory Madden (2003). The future is muddled with uncertainty, so anything that lays further ahead in time is consistently devalued. Temporal myopia can thus be measured with *delay discounting* tasks such as those used by Madden, showing that the value of a particular good decreases with relation to the time it takes to obtain it.

Several other follow-up experiments in the longitudinal Marshmallow study were conducted. In 2002 and 2003, for instance, a study showed that "longer delay of gratification at age 4 years was associated with a lower BMI [body mass index] 3 decades later" (Schlam et al. 2013). Another follow-up experiment was conducted in 2011 in which 59 of the subjects—now in their forties—were tested (Casey et al. 2011). The subjects sat this time in front of a computer screen which displayed a sequence of photographic portraits. Depending on the characteristics of the facial expression displayed on the monitor, the subjects had to either press a button as fast as possible or do nothing. Each image remained very briefly on screen, giving the subjects little time to react. Previous studies had shown that we tend to react more readily in emotionally loaded situations than in emotionally neutral ones (Ochsner and Gross 2005; Sanfey 2007; Heatherton and Wagner 2011). So, when the subjects were asked to react to neutral facial expressions with the press of a button and not to react to happy faces, those who had failed to obtain the second marshmallow the first time around forty years earlier were now more likely to press the button when a happy face showed up, even though they were asked not to. This study linked the capacity to suppress impulsive reactions to brain areas located in the frontal cortex (Wittmann 2012, p. 30).

A vast number of video games relate to Mischel's findings. Video game genres could even be categorized in terms of how they engage with our temporal perspective, and one might speculate that the preference for a particular genre relates to the temporal frame a person tends to prioritize. While some games emphasize fast reflexes and are thus more attuned with a present-oriented mindset, others focus heavily on careful planning and resource management. Success in a strategy game like COMMAND & CONQUER or CIVILIZATION V, for example, depends largely on the players' capacity to spend or save resources and command units with long-term goals in mind. Decisions made early in the game can have a strong impact on what happens in the following hours. Games like DOOM or CUPHEAD, on the other hand, demand fast and precise reactions from the player,

and, though some foresight is nonetheless required, long-term planning is not as important.

Other games exploit our temporal myopia for monetary gain. In CANDY CRUSH SAGA (King 2012), a mobile match-three puzzle game, the player has five lives, each of which is lost every time the player fails a level. Once all lives are lost, the player can purchase more (with actual money), wait half an hour for one life to replenish, or ask a friend for one over Facebook. Additionally, if a level is too hard, the player can buy a Booster to make it easier and remain in a state of flow. CANDY CRUSH SAGA speculates with the players' boredom and anxiety, offering a way out of those undesirable experiences through spending.

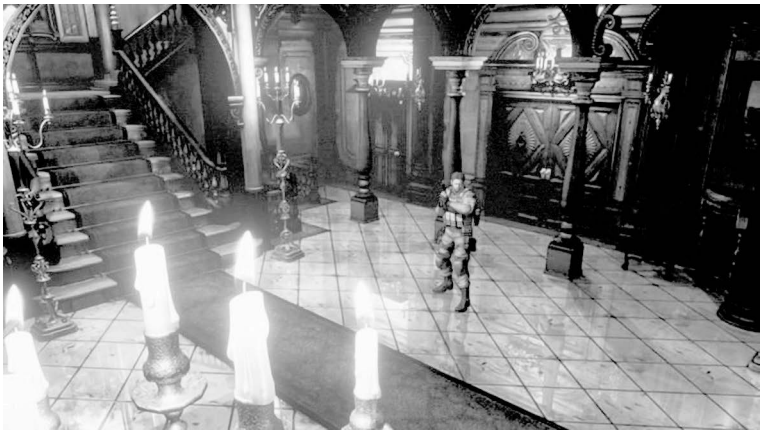
The genre known as *survival horror* is of particular interest in this context, since it focuses specifically on overcoming temporal myopia through the mechanics. This genre is well known for featuring vulnerable protagonists that have to survive in an unsettling and hostile environment with very limited resources. In what follows I will show how the psychological notions of time perspective, temporal myopia, and delay discounting are reflected in the RESIDENT EVIL HD REMASTER (Capcom 2015). This game is the latest version of RESIDENT EVIL (Capcom 1996), one of the titles that defined the genre in the mid-1990s and which is now popularly regarded as a survival horror classic.[2]

RESIDENT EVIL: THE MECHANICS THAT DEFINED SURVIVAL HORROR

The game begins as the S.T.A.R.S. (Special Tactics and Rescue Squad) Alpha team is searching for the Bravo team, which disappeared during the investigation of a series of gruesome murders that took place in Raccoon City, where victims were savagely slain and eaten by groups of people. After finding the remains of the missing party's crashed helicopter along with a Bravo team corpse, the Alpha team is attacked by a pack of decaying dogs, who take down one of the teammates. The survivors run towards a mansion for shelter as they see their chopper take off, abandoning them in the murky woods. This sequence is shown to the player as an introductory cutscene.

2 In fact, RESIDENT EVIL was the first game to use the term *survival horror* (Fahs 2009, p. 4). At the beginning of the game, a screen greets players with the text "Enter the Survival Horror."

Figure 3.4: RESIDENT EVIL HD REMASTER.



Chris Redfield in the main hall of the mansion.

As far as horror settings go, the abandoned mansion is quite the cliché, but it provides the game with a fitting somber atmosphere. Once inside the mansion, the player takes control of one of two available characters, Jill Valentine or Chris Redfield—the choice is made before starting a new game. Choosing whether to play as Jill or Chris doesn't change the story significantly. When choosing Jill, for instance, Chris disappears on the way to the mansion, and the player character is together with another teammate, Barry Burton. Selecting Chris introduces a surviving Bravo team member, Rebecca Chambers, and Jill and Barry go missing. Albert Wesker, a third teammate, is alive and well with both protagonists. The next step for the remainder of the Alpha team is to explore the mansion and to find a way to escape.

Most importantly, each character possesses individual traits: while Jill has lower health (she can die faster) and deals less damage than Chris, she has a bigger inventory and can thus carry around more items at the same time. The characters also obtain different tools and weapons—for example, while Chris receives a flamethrower at a later point in the game, Jill obtains a grenade launcher. These and other differences make playing the game with each of the characters a slightly different experience, but it remains true in both cases that the game is punishingly difficult. The choice of character is not so much a matter of difficulty as of desired playstyle.

Once the game starts, the player soon finds out that the house is infested with ravenous zombies. While these enemies move slowly and alert the player of their

presence with growls and groans, the game's mechanics—in combination with the ominous setting—manage to make the encounters challenging and frightening.

RESIDENT EVIL has fixed camera angles from which the player observes the action. Once the player character moves to the edge of the frame, the game switches to a subsequent camera angle, revealing space that previously remained unseen (see figure 3.5). Since camera angles are predetermined, the player never knows for sure where the character will stand next in relation to the frame, which makes movement planning more challenging than with an over-the-shoulder, player-controlled camera (for a comparison see figure 3.6). While the current angle might be a bottom-up view, the next one could place the camera above the avatar and on the opposite side of the room. Additionally, fixed camera angles can conceal information by leaving it off-camera or by hiding it on the backside of objects.

In addition to its fixed camera angles, the original RESIDENT EVIL used what is popularly known as *tank controls* for the movement of the avatar. With this control scheme, the player makes the character move forward in the direction it is facing at that moment by pressing up, and backward by pressing down. To rotate the avatar in order to change direction the player needs to press left or right. The 2015 remaster lets players choose between the early control scheme and a more intuitive alternative. These new movement controls eliminate the need to rotate the player. The direction in which the character moves will directly correspond to the direction pressed on the controller: Up moves the character upward in the frame or away from the camera, down downwards or towards the camera, right to the right side of the frame, and left to the left side. The character will move forward in the indicated direction and automatically rotate if needed.

Figure 3.5: Camera.

Top: Chris Redfield walks towards the camera in RESIDENT EVIL HD REMASTER. Bottom: Once the character reaches the edge of the frame, the game switches to a camera with the opposite angle, now displaying the character from behind

Figure 3.6: Aiming.

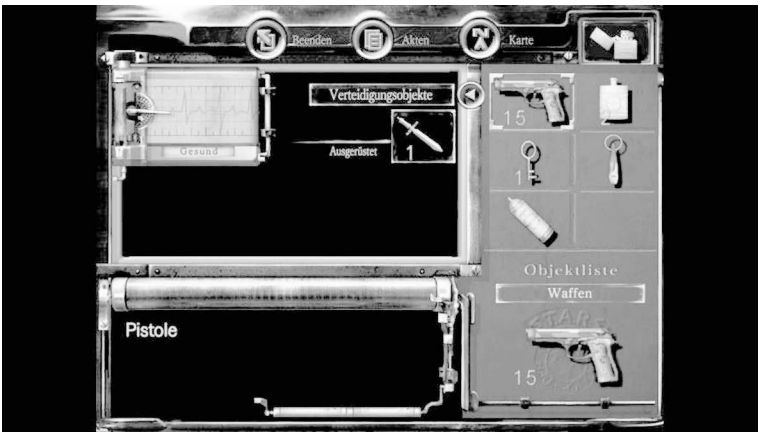
Top: Aiming the gun at a zombie with the over-the-shoulder camera in RESIDENT EVIL 4 ULTIMATE HD EDITION (Capcom 2014). Bottom: Aiming in RESIDENT EVIL HD REMASTER with a fixed camera.

The game further complicates character movement by implementing a constrained shooting system that does not allow the character to walk while aiming a weapon. In order to shoot, the player has to press and hold the button assigned to aiming so that the character lifts the weapon. Once in this stance, the player can shoot with the press of a second button. To aim the gun up or down, left or right, the player has to use the same keys assigned to movement. These buttons will now either rotate the avatar (pressing left or right) or pivot its arms up or down (pressing up and down)—aiming the shotgun up and firing it point-blank at a zombie, for example, is likely to take it down with a single headshot. Thus, players can only approach encounters with a binary fight-or-flight strategy, but never do both at the same time—it is impossible to shoot while retreating, for instance. If the player chooses to fire, they commit to a particular position in space as long as they continue aiming the weapon. If the player chooses to run away, the character becomes defenseless. Moreover, when the player character's health drops significantly, the character will start limping, which makes it even more vulnerable to enemy attack.

The player characters in RESIDENT EVIL are weak compared to their resilient enemies. But, as if this aspect would not render the game challenging enough, if a player manages to neutralize all zombies in a room, they need to burn their bodies, or they will otherwise come back as the faster and more resilient Crimson Heads. To this end, the player needs to carry around a lighter (which Jill has to find but Chris carries from the beginning) and a fuel canteen. The latter has limited uses and needs to be refilled periodically.

RESIDENT EVIL is not about running through corridors guns blazing, as is the case in DOOM or other action shooters; it is about knowing when to fight and when to flee. Another feature that makes the game particularly challenging is that the player can only save the game at predefined locations scattered around the house. These are signified by typewriters, which are usually inside safe rooms where the player is free from harm—a fact underscored by a soothing tune that plays when inside these rooms. When the player interacts with a typewriter, the save menu opens. But the player needs an ink ribbon to save, a resource that is always in limited supply. Thus, even the act of saving your game requires careful consideration. For this reason, dying in RESIDENT EVIL tends to be more punishing than in games with frequent checkpoints or in which the player can save at will, as it is more likely that the player will lose valuable progress.

Figure 3.7: Chris Redfield's inventory with five out of six slots occupied.



The saving mechanics lead me to the final point of this game analysis: resource management. Not only the ink ribbons, but every other resource in Resident Evil is scarce. The player never has a surplus of bullets or medicinal items. Every shot fired counts, and every missed shot leaves a bitter aftertaste. Even when the player somehow manages to obtain several weapons and their respective ammunition, both Jill and Chris have limited inventories (Jill has eight slots, and Chris six). The player has to choose what objects to carry around at any given time and the rest has to be stored in item boxes found in safe rooms—weapons occupy one inventory slot, extra ammunition can be stored in a second one. Typically, there is not much space left in the inventory for ammunition and weapons, since the player needs to carry keys, puzzle items, medicinal herbs, the lighter (if the player chose Jill) and the fuel canteen, while leaving one or two slots free in case they find something useful. Inventory management under these conditions is by no means an easy task.

THE AESTHETICS OF SELF-CONTROL

In the disquieting rooms and corridors of the abandoned mansion, the fear produced by the approaching undead might lead to a careless reaction that could waste an unnecessary amount of ammo. To avoid impulsive squander, the player can choose to attack lone zombies with the knife, a clumsy and ineffective weapon that takes one inventory slot but has the advantage of not requiring ammunition. In this way, bullets are saved for situations where the player faces two

or more zombies at once, or more potent enemies. Another possible strategy is to simply run past the slow-moving zombies when the room gives the player enough leeway.

These approaches might supplant the feeling of relative safety provided by a firearm with an unnerving sense of danger. Using the knife has the disadvantage of being a very ineffective melee weapon and, since the zombies attack exclusively at close range, anything short of flawless timing can give them a good chance to strike. Running past enemies might also get the player character dangerously close to them—and, depending on the situation, they can even follow the player character into different rooms. A gun, on the other hand, disposes of the zombies while keeping them at bay. Nevertheless, the advantage of using the knife or evading enemies is clear: the player can move ahead without having used a single bullet, which could prove valuable for future (and possibly more challenging) encounters.

Even while using the handgun, impulsive reactions might lead to imprecise firing and wasteful use of ammunition, especially given RESIDENT EVIL'S quirky controls and disorienting camera angles. In the mansion's narrow spaces, it is important to keep a steady hand. If the player senses that a rushed reaction could lead to a misfire, then fleeing and finding a better stance from which to attack is the best strategy. Just like the test subjects who pressed the button when a "forbidden" happy face flashed on the screen, impulsive players might start shooting before thinking. Zombies are slow but tough and taking them down requires several rounds from a magazine with a limited capacity. If a firearm is emptied and the approaching Zombie has not yet fallen, the player will need to reload the gun to continue firing, provided they are carrying extra ammunition. Reloading is performed through an animation that makes the character vulnerable to attack—this can be avoided by reloading in the inventory screen.

RESIDENT EVIL is a constant tradeoff between distress and safety—or at least a relative feeling of security. Since games tend to increase in difficulty with time (and this one is no exception), saving ammunition for later challenges is crucial. Temporal myopia can be a serious disadvantage in this type of game, and future-oriented players will likely have a better chance at succeeding than more present-oriented ones. Choosing the stressful and riskier strategy in the present might contribute to a safer stance in the future. From this perspective, RESIDENT EVIL is a virtual *bullet test*, where ammunition is to players what marshmallows were to the children in Mischel's study. The gratification in the case of the marshmallow is the pleasure of eating it. In the case of the bullet, it is the feeling of safety gained by firing it. The delay of gratification is in both cases an exercise in self-control.

Playing the Player

As we play games, they, in turn, play with our cognitive capacities. Looking at the work of psychologists like Walter Mischel not only reveals a part of the human psyche that has a crucial function in our interaction with video games, it can also be useful to understand how exactly game design can hijack our cognitive systems and influence our behavior.

The survival horror genre poses a concrete challenge in psychological terms. The settings and mechanics are expressly designed to elicit fear in players: the ominous rooms of the desolate mansion in RESIDENT EVIL are teeming with lurking threats that can quickly end the player character's life, and the shortage of resources combined with constrained movement and shooting mechanics elicit a constant sense of helplessness. The player's mental hazard detectors are thus easily agitated, to the point that they can get startled by false alarms, like the shadows cast by a candle's flickering light—not to mention the justified scares, like zombies unexpectedly breaking in through windows. Players are thus prone to react impulsively and to lose focus of long-term goals. A successful player needs to maintain a future-oriented perspective in spite of the myriad unsettling stimuli that pullulate throughout the mansion.

Nevertheless, players are not invariably bound by their cognitive proclivities. In one of the instances of their Marshmallow Test, Mischel and his team encouraged some of the kids to use different strategies that could distract them from the reward (Mischel et al. 1972). These strategies had a dramatic impact on the amount of time that children were able to wait. Some were instructed, for instance, to think of something fun while waiting, others of something sad, and others about the reward. Thinking about something fun proved to be a very successful strategy compared to thinking about something sad or focusing on the reward. Those kids in the "think fun" group had a mean waiting time of over 13 minutes, while the "think sad" group waited for a mean of five minutes and the "think reward" for just four. This experiment shows that, though temporal biases are somewhat predefined dispositions, they are not absolutely determinant factors of behavior. By modulating their states of mind, the participants could significantly improve (or impair) their performance in the test.

An alternative strategy that the researchers instructed the children to apply was to imagine that the marshmallow on the table was only a picture of a marshmallow by adding an imaginary frame around it (Mischel et al. 1989). Children who did so delayed gratification for almost 18 minutes. Curiously, a group of kids who participated in the experiment with an actual picture of a marshmallow instead of the real thing waited for the same amount of time as the

ones who imagined that it was a picture. Yet another group, which was given a picture but instructed to imagine a real marshmallow, waited for less than 6 minutes (all values being averages). These results demonstrate that the mental representation of the object has a significant impact in decision making. Granted, a kid's imagination is normally more powerful than that of a teenager or an adult, but there is a way in which this still applies after infancy.

The philosopher Tamar Szabó Gendler distinguishes between the notions of *belief* and *alief*. Belief is that which we rationally understand as true, while alief is that to which we react in spite of disbelieving it. Among other examples, Gendler mentions the experiments conducted by Paul Rozin which showed that adults "are reluctant to drink from a glass of juice in which a completely sterilized dead cockroach has been stirred, hesitant to wear a laundered shirt that has been previously worn by someone they dislike, and loath to eat soup from a brand-new bedpan" (Gendler 2008, pp. 635-636). Every grownup person in their right mind knows that a new bedpan is a completely innocuous food vessel. However, the mental associations produced by its originally intended use as an in-bed toilet make the sheer thought of eating out of it revolting. Something similar happens with fiction. When playing RESIDENT EVIL, we believe that it is a game and that everything we see is ultimately just zeroes and ones inside our computer, but we alieve that we are alone in a zombie-infested mansion. If players focus on their beliefs instead of their aliefs by reminding themselves that it is just a game, it will become easier not to fall into a present-oriented mindset—just like the children who looked at the picture of the marshmallow keeping in mind that it is just a picture.

In an early version of the experiment, Mischel wanted to find out if children could wait longer while the reward was in the room or when it was not present. He found out that "the presence of the rewards serves to increase the magnitude of the frustration effect and hence decreases delay of gratification by making the waiting period more difficult" (Mischel and Ebbesen 1970, p. 337). That is, the very presence of the reward made it more tempting. Applying this logic to RESIDENT EVIL, the best thing for players to do in order to save a particular resource is to simply store it in the item box. If players carry the handgun around, it will be harder to limit themselves to using the knife and avoiding zombies. Leaving the gun in the chest might seem like the commonsensical thing to do; after all, you cannot use what you do not have. But, following the experiment, one could even predict that the allure of the gun would decrease as well, and the player would focus more effectively on the available options instead. It would be reasonable to expect a player to be more efficient at using the knife in this condition than if the easier option of relying on a gun were readily accessible.

The capacity to resist short-term gratification in favor of later benefits is certainly not just central to psychological experiments and video games. It is a conundrum we face whenever we decide to go on a diet, stop smoking, start exercising, or study for an exam instead of playing video games, to name a few examples. RESIDENT EVIL takes this familiar experience and overemphasizes it through the interplay between its audiovisual presentation and its mechanics: While the environment is designed to elicit impulsive behavior, the mechanics require players to be thrifty and carefully plan their actions. The discomforting effect produced by these conflicting stimuli embodies what could be called an *aesthetic of self-control*.

The notion of players voluntarily engaging in activities that conduce them to engage in self-control evokes an ancient philosophical question: Why do we enjoy cultural products and activities that emulate situations that we would normally find unpleasant? Psychologist Paul Rozin has studied this phenomenon, which he has dubbed *benign masochism*. In Rozin's words, benign masochism

> "refers to enjoying initially negative experiences that the body (brain) falsely interprets as threatening. This realization that the body has been fooled, and that there is no real danger, leads to pleasure derived from 'mind over body.' This can also be framed as a type of mastery" (Rozin et al. 2013, p. 439).

One thing seems clear: The self-control tests of the survival horror genre are a cherished form of entertainment. RESIDENT EVIL'S success is evidenced by its two remakes, several sequels and spinoffs, and the transmedia extensions like films and comics that it has spawned since its first appearance twenty years ago.

The temporal landscape's perspective directly relates to the psychology of self-control. While driving through the temporal landscape we can focus on the rearview mirror (the past), on the landscape immediately around us (the present), or on the road ahead (the future). While we can direct our attention to the different parts of the landscape, the environment and our internal predispositions can condition us to prioritize a specific time frame over the others. Video games, as this section has shown, can alter our relation to the temporal landscape and incorporate time perspective and self-control as part of the gameplay. The next section will focus on time perspective in connection to how video games generate expectations, that is, how they create possible futures in the player's mind.