# The skillful work of play in Counter-Strike

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## Introduction

Games have an increasingly important role in modern contemporary culture. Indeed, the effects of games upon culture, childhood development and social relationships have all gained considerable academic attention. Studies have documented how games support interaction (Brown 2004, Moore 2006), creative player activities (Wright 2002), the development of 'economies' (Castronova 2005), friendships (Yee 2001) and, more negatively, addiction (Yee 2002).

Yet this work on games contains a couple of unusual absences. Firstly, research for the most part focuses on games that feature long-term persistent environments (e.g. Star Wars Galaxies (Ducheneaut 2004), Everquest, World of Warcraft, or There (Moore et al. 2006)), with only a handful of examples examining other popular genera of games such as first-person shooters (FPS) (e.g., Manninen and Kujanpää 2005, Wright 2002). Secondly, we find little in the way of investigation into how games themselves are *played*. Whilst the literature focuses upon social relationships formed online, the creative activities of players around the game, the nature of conversation online, the identities and plots produced, or the learning experiences of players, and so forth, there is little documentation and investigation of the intricacies of gameplay—i.e., the very thing that attracts players in the first place.

Thus, this paper will engage with the rather overlooked genus of first-person shooter, and our focus will remain relentlessly upon the *mechanics* of gameplay, and the player's engagement with that core mechanic (Salen and Zimmerman 2003). As with musical instruments, the 'play' of a game's core mechanic and the pleasure obtained from the complex manipulation of machine, player and environment is often the nexus for their popularity. In this paper we shall present a limited explication of the nature of the player's experience of this core mechanic as part of an attempt to investigate in-depth *how* gameplay takes place. In particular, we shall discuss the skillful work of playing the popular online FPS, Counter-Strike (CS)[1], exploring how it is that players learn, explore, and collaboratively 'kill' each other in this virtual world.

## Sudnow's account of skill

As part of our examination of player skill, we draw on Sudnow's overlooked account of video game skill, *Pilgrim in the Microworld* (henceforth referred to as *PitM*) (Sudnow 1983). In the book, Sudnow presents a detailed account and description of the practicalities of developing skill in the late 70s game, Breakout (depicted in Figure 1). Breakout is a very simple game where the player moves a 'paddle' (or bat) along the bottom of the screen, attempting to hit (and thereby remove) bricks located at the top of the screen with a bouncing ball. Like Sudnow's previous and more widely cited book, *Ways of the Hand*, in which he examined in-depth the work of learning and skill of actually playing jazz piano (Sudnow 2001), *PitM*

[1] More precisely, we have examined Counter-Strike: Source, the most recent version of Counter-Strike (the original of which was released in 1999). Although there are differences between the previous version and the Source version, we feel that many of the points that are presented in this paper have relevance not only for both versions of the game, but for FPS games in general.

provides an account of the actual work involved in moving from mere observation to expert or skilled performance.

In *PitM* Sudnow describes exactingly how he moves from familiarising himself with the equipment, to acquiring basic manual skill, to cheating, to tactics, to strategy, to finally an engagement and understanding of the rules of play of Breakout. Although *PitM* is an account of acquiring skill on a decidedly old-fashioned and seemingly outmoded game, Sudnow provides invaluable insight into the 'missing what' of a phenomenon that is now a massively popular activity. (Incidentally, Salen and Zimmerman (2003) frame Sudnow's book as being about the "experience of play" and experience in and as participation in the game. They take it as an inspiration for their attempt to describe not just the narrative of games but also their playability.)

There are three main features of *PitM* that are of particular relevance to our study: manual dexterity; developing how to 'look ahead'; and the terrain of the game.

The first aspect of Breakout that Sudnow must contend with is the control system for Breakout and the manual dexterity required to coordinate his hands' actions with the action on the screen. The game uses an unusual control—a small device held in the hand with a rotary knob on the top—in order to move the paddle left or right. Sudnow importantly differentiates mere physical dexterity required to manipulate this rotary knob from the skills of hand and eye acting in concert together in order to move the paddle to a particular position on the screen (Sudnow 1983, p. 40): "At first it felt like my eyes told my fingers where to go. But in time I knew the smooth rotating hand motions were assisting the look in turn, eyes and fingers in a two-way partnership".

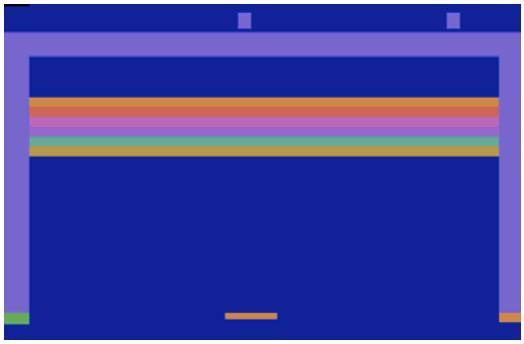

*Figure 1. A screenshot of Breakout*

In the course of cultivating a basic dexterous competence, it becomes apparent that Sudnow also develops a skillful way of looking at the current state of play as well as a skillful and prospective 'looking ahead' in order adequately deploy those skills according to possible future occurrences. For example, at first Sudnow plays by "glu[ing] [his] eye to the ball" (Ibid, p. 45) as it bounded around the screen, but then subsequently he discovers that "peripheral vision sufficed" (Ibid, p. 47). As this develops, he then starts looking in advance of where the ball will be, finding that "the eyes could plan" (Ibid, p. 48). His vision and motion thus develop in tandem to produce his motion skills.

Finally, and most extensively, Sudnow discusses the development of his becoming attuned to the terrain of the game. He states that "[i]n ten hours you've got all the manual skills to do the breakout ballet, and then spend your time trying to decipher how movements can be laid out in the thoroughly blueprinted neighbourhood" (Ibid, p. 131). As such it is the next step after his development of a 'skillful look.' As a result of becoming accustomed to this terrain he gains a competent sense of how to play the game and what to 'do' in the game, in that he is both able competently react to difficult contingencies that arise, but also becomes attuned to how the game will play out. Mastering a game is knowing where it will go.

# A drop into the action

To examine CS we have recorded video of expert players engaged in the game, alongside informal discussions with them to clarify the video. In addition, the authors themselves have played the game extensively in order to obtain insight into the nature of CS play and the play of others. Unfortunately, in this paper we only have space to discuss one video extract. In forthcoming work we shall present a broader range of data, however this one extract does reveal much of the skill of CS play, even though it is only seconds in length[2].

[2] Indeed, for the interested reader, we suggest they go online and test our assertions against their own play.

A Counter-Strike player's experience typically begins with the selection of a suitable server on which to join a game (a list of active game servers is made available during a session). The game itself is played on a particular set of 'maps,' each of which is effectively a self-contained 3D virtual environment. The player 'drops into the action' by joining a desired game, being presented initially with a choice of two teams: terrorists (T) and counter-terrorists (CT). As CS works on a rounds-based system, the player must wait until the current round has ended before they are 'spawned' alongside the rest of their team in particular points on the map at the beginning of the next round. The players choose their weaponry, armour and other any other equipment (such as fragmentary grenades or 'flashbang' grenades) they can currently afford. Each map has a certain objective tied to it, for example: the terrorist side must plant a bomb, and stop the CTs defusing that bomb; hostages must be rescued by the CTs and the terrorists must try to stop this rescue occurring. The round ends either when the appropriate mission objectives for either side is accomplished, or when the number of players on one side has been depleted to zero. If neither of these situations occurs, a timer ensures the round ends within a few minutes (the timer starts at the beginning of the game, permitting two or three minutes of game-time).

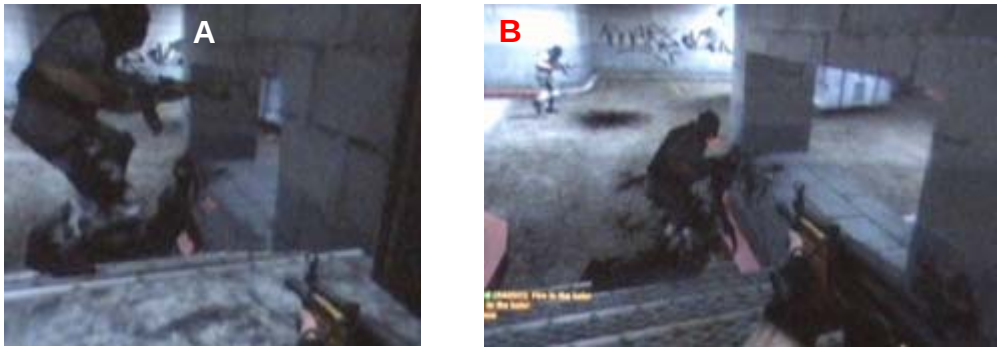


*Figure 2. Approaching the fight with co-players A and B*

Given the very visceral and rich experience the game of CS presents to the player, we shall orient the reader to the practicalities of skillful play by examining and briefly analysing the key features of a video vignette. The vignette here takes place on one of the most popular CS maps, "`cs_office`".

> The round has just started, and terrorist players have 'spawned' at their start point. The player we are following picks an assault rifle (an "IDF Defender") and rushes a short distance straight to a stairwell, where we shall join the action. Two other co-players are immediately encountered and visible here, one on the far-side of the room and one directly in front of the player, as is the currently slumping body of a counter-terrorist who appears to have been recently dispatched.
>
> The fellow Ts (A and B) are oriented perpendicularly to the player, who is slowly edging down the steps (Figure 2). As the player performs this manoeuvre, the player's orientation switches to the right whilst ducking and attending to the opening in the wall (visible in Figure 2). Once the bottom of the steps has been reached, the player heads to the right down the hallway, overtaking the co-player that was immediately in front of them. As they do this, the player performs a leftways glance en-route, appearing to note co-player B's positioning in the space (see Figure 3, right), who in turn is facing the length of the hallway beyond. The particular configuration of this space can be seen in Figure 5, and generally consists of a number of ('wooden') crates and large ('metal') storage containers. The player comes to rest next to one of these crates, ducking. The player then edges (strafes) around the large container (Figure 4), maintaining their aim at approximately the right height for a potential target at the end of the hallway. As they begin their strafe, sparks fly off the side of the container from shots fired possibly by the enemy or player B. As the player then edges slowly round the container, firing a couple of shots, a lone enemy CT player down the far end strafes the opposite way, exposing themselves to the player's line of sight. A short exchange of fire ensues with the enemy as they both attempt to get a bearing upon on another, and within a second the player stands up and strafes back behind cover. Sparks fly off the front side of the container, and the player turns round to the left at the other large container. This glance reveals another player milling around the container's edge; the player turns back to, and then reloads their weapon. This previously-glaced-at-co-player subsequently

approaches the player and shoots as the reload is being performed, ending with the player's death. The co-player that was the subject of these glances was actually an enemy, a CT.

In total the entire round for the player took just over 30 seconds.

*Figure 3. Getting closer to the container (left), glancing at co-player B (right)*

*Figure 4. Entering the danger zone, spotting the enemy*

# Skillful play

This extract reveals many of the features of play in CS—the ways in which players move, how they are careful to control what others see of them, and the role of presence and how actions are chained together, to name a few. To dissect some of the skills of CS play we focus on three issues: manual dexterity; visibility; sequences of action and the prospective features of play.

## Manual dexterity and visibility

Manual dexterity is required to adequately control the mouse and keyboard. For a typical configuration of CS, the mouse enables the player to direct their viewpoint and the trajectory of their motion as well as enabling weapon firing, weapon swapping (e.g., between a grenade and a handgun) and secondary weapon functions such as a scope or semi-automatic/fully-automatic modes. The keyboard in turn enables the player to grossly direct their movement forwards, backwards or sidestepping, as well as providing weapon reload, duck and weapon drop keys (to name a few).

The dexterity required to effectively manipulate these controls becomes apparent if examine what was done by the player to move their avatar in the vignette. Figure 5 attempts to capture some of the movement around the local terrain of the map, and the way in which the player deftly and rapidly performs multiple actions in the course of their movement down the stairs. 'Glancing' as the player does is a decidedly nontrivial but highly common activity; in this instance, it involves heading straight (pressing the 'forward' key), performing the glance with the mouse by moving it to the left and, as this is done, switching directions on the

keys to maintain the current path (pressing the 'right' key), finally followed by pointing the mouse back to its original direction and heading straight once again. All this is accomplished smoothly over the course of a few seconds and is an action that is produced reflexively within the terrain of the game (which, in this case, happens to be boxes).

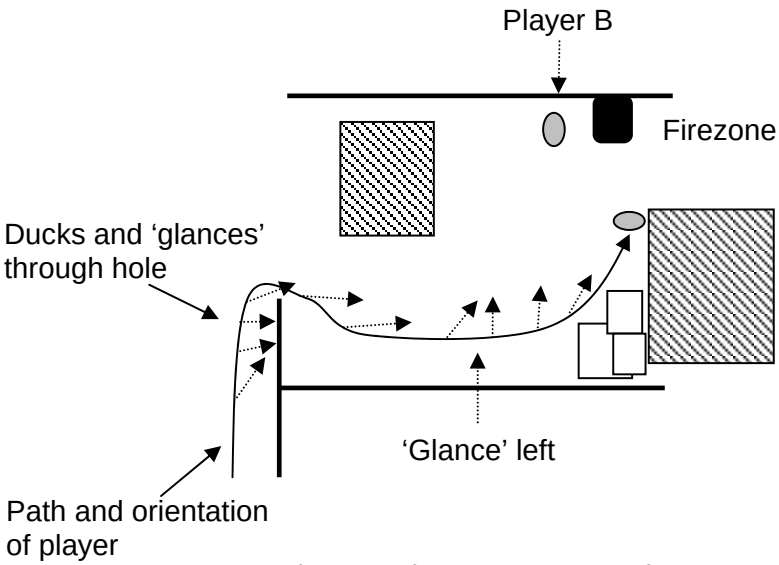


*Figure 5. Player movement path*

Dexterity is not deployed alone, for like Breakout, CS requires concerted hand-eye coordination (and hand-ear coordination). CS's environment is far more complex than Breakout, however, and its 3D conventions offer to players not only a richer experience of the environment, but also different perspectives on the action. From their individual perspective, players must rapidly visually and aurally identify and 'read' elements of the game, such as the spatial arrangement of objects or phenomena in the environment (e.g., lighting, gunfire, smoke). Centrally, players must enact a skillful analysis of what other likely perspectives of co-players would be (perhaps most obviously difficult in this regard is spotting 'snipers').

*Figure 6. A terrorist (left) and a counter-terrorist (right)*

Within the vignette, the mutual visibility of the team *as* 'my' team (and not the enemy) is exhibited in various legible features of co-players A and B as presented to the player: appearance, conduct and location. Firstly, when a player chooses the team they wish to be part of at the beginning of a session (i.e., whether they are a T or CT), they also choose the 'skin' and model that represents them within the virtual environment (see Figure 6 for two examples[3]). Becoming familiar with these different appearances is important to regular play, 'regular play' in the game being spotting and targeting enemies (those co-players with models and skins of the opposing team), and avoiding friendly fire (those co-players with models and

[3] There are two or three of each skin/model type (T and CT) available in CS. At the time of writing there were more player skins/models available in the original version of CS than the version we examine, CS: Source.

skins of the player's own team). Both co-players within the vignette (A and B) have chosen a particular skin that is identifiable as a skin for the Ts. Secondly, avatars in the game have particular orientations and locations, and perform certain conduct within the terrain that mark them either Ts or CTs. In the vignette co-player A and B are recognisable as fellow Ts by their movement towards the enemy's zone and location as the player encounters them, as well as not shooting at the player, and seemingly not paying much direct attention to the player's activities. Thus, by virtue of their at-a-glance visual appearance, conduct and location in the space, the co-players become identifiable and legible as teammates. Becoming familiar with different at-a-glance features of 'us' versus 'them' is vital to competent play.

## Fatal visibilities

There are reasons why the basic competencies involved in CS play as we have described in the previous subsection exist as they are. For the player, much of this localised skill is employed in maintaining an asymmetrical presence; that is, the player's management of their visual and aural presence with respect to the enemy team's awareness of their presence within the virtual environment. We have already highlighted some of the skilled hand-eye coordination involved in artful crafting of their movement about local game terrain (e.g., crates, the walls, etc.) and with respect to co-players and the opposing team members. This is performed in order to enhance the rapidity with which their avatar traverses the virtual world, and to ensure continual readiness for fight, flight or cover. Such techniques of terrain traversal employed by the player enable that player to, asymmetrically, display presence to their side and hide it from enemy players.

Within CS, a player 'seeing' a co-player, such as an enemy, implies a potentially fatal mutual visibility in that the co-player has the potential to reciprocate this, i.e., target them. Even 'cover' may carry with it projectable points of appearance that the player must consider. Given the spatialised audio features of the game an enemy co-player also has the potential to 'hear' the other player's footsteps and gunfire thereby giving away their presence in a particular location. Asymmetrical presence is thus about avoiding (or managing) the establishment of equal reciprocity between players on opposing sides in order to surprise those opponents (and thus gain the upper hand).

How one appears to others is also impacted by the technology that the game uses. The quality of graphics is an important feature for the player's management of their presence. The rendering of textures, complexity of avatar models, lighting models, effects (such as smoke), the accuracy of weapon behaviour and the introduction of real-time physics all present in the game contribute to the realism and modify the way in which presence is felt within the game. For the player, identifying who is who, where the enemy are, targeting enemy players, hiding, sniping and so on are contingent upon the quality of video and sound rendering and the level of visual and aural accountability that results.

We noted that within CS, glancing while running and rapid 'reading' of the enemy players are important skills for the player to foster. Of related interest here is the way in which the field-of-view (FOV) provided by the game is distinctly limited (as with any 'immersive,' first-person virtual environment), and how this features as part of the skill in glancing, spotting the enemy, hiding one's presence, targeting, shooting, missing or hitting the enemy, and so on. The default FOV is 90 degrees meaning that in 'open' terrains competent players must perform continual looking actions in order to establish at least 180 degree awareness of their surroundings (i.e., 'mirroring' the human FOV). Managing this field-of-view is a skill that employs dexterous manipulation of the mouse and keyboard, and the player's visual spotting skills in concert with this. We note how this limited FOV's adds depth to play and creates an enjoyable aspect of the game, rather than poses problems for collaborators (Hindmarsh et al. 2000).

## Sequences of action and prospective play

In becoming a good player of Breakout, Sudnow increasingly sequenced and ordered his play, and there are similar aspects to play in CS. Chaining together minor though essential accomplishments, such as glancing sideways while running, into longer sequences of actions adapted to the local terrain is a major challenge for the player's progression to competence. Within the vignette this can be seen in the way in which glances are performed as part of such a sequence. In the vignette, the player has, previously their glancing at co-player B, performed a similar glance manoeuvre at the hole in the wall (see Figure 5), however this was combined with a ducking action, and then followed with a sidestepping around the edge of this particular wall, leading into the glancing we have just examined in the previous subsection. These two glancings are crafted with

respect to the unfolding exigencies local terrain. In this instance, the initial examination through the hole (seeing that the way ahead is 'clear') plays a part in configuring the player's subsequent movement through the space.

Successful sequences of action (such as those just described) involve careful timing, and players must perform them and deploy each sequential action, such as movement, posture (e.g., ducking), orientation, and aiming, artfully and orderly. These orderly sequences must also be engaged with the terrain, such that movements, orientations, aiming and so on are crafted specifically for corners, doors, across open spaces and down corridors. Timing also requires rapid reaction from players in relation to the enemy's move: from seeing an enemy player to aiming and firing will be that fraction of a second faster for the experienced player playing against in-experienced players. A novice player often finds themselves constantly out-paced by this, and the game can seem impossibly fast (and frustrating). A developed competence in the very tight sequencing of action and ways of moving enables the player concentrate members of the opposing team without having to continually reflect on the minutae of their actions. Thus experienced players smoothly 'slip into,' for example, 'well-worn' positions within and routes through the terrain as they duck, aim, firing and retreat away quickly. Again we return to Sudnow's account in which the development of manual dexterity is one initial part of becoming a Breakout player, as play begins to be based around timings, patterns and sequences of action within the terrain of the game.

Because moves in CS are sequential they have a prospective element in that they can be used to project to likely next moves. Competence in CS enables the player to appraise configurations of the current state of play and the prospective possibilities of the progress of that play. Within the game this might involve anticipating an enemy player moving into the player's line of fire, or perhaps waiting for a particular movement out from behind the cover of a crate or wall. Thus 'predicting what will happen' and the use of projected or assumed sequences of action of co-players (whether they be friend or foe) becomes important for the player's responses to enemy conduct, who similarly utilise the possibilities of 'what next.'

Players, however, do not and cannot 'plan' their actions; any plans, such as following a particularly well-known route or finding a sniping position, cannot alone deal with the exigencies of the situation as and when they arrive. In addition to this, such 'plans' are made visible in the local histories of play. Thus players, in developing competence, must conduct actions reflexively in situ (Suchman 1987) since every game creates unique requirements. So, although the terrain of play might appear a stable geography of expectations and possibilities, players constantly change their activities within it in an attempt to confound the expectations of the opposing team. The enemy team members become aware of the strategies and conduct of the opposition and adapt their own play accordingly. In the vignette, for example, the player was confounded by an unexpected attack from behind as a member from the opposition changed their approach. Whilst conduct on the map is not stable, stability is achieved, however, by repeatedly playing on the same map in order to experience the multitude of possibilities. Over lengths of time this experience provides a static background for the development of skill, enabling a novice player to eventually become aware of the game's prospective possibilities.

# Conclusions

In this paper we began by suggesting that the actual work of play and development of competence, especially for FPSes, has largely not been explicated within the literature that examines computer games. Sudnow's account of skill provided a starting point for our own investigations into the skill of CS play, and here we drew on a number of key aspects in order to inform our analysis:

- Dexterous and perceptual skills that are deployed by the player in concert in ways that manage the player's presence in the virtual environment;
- Competent players enact these basic actions sequentially with respect to the local terrain; and
- Players prospectively developing a way of seeing the game as a textured terrain of possibilities.

But CS and Breakout also have points of departure. For example, it is not incidental that Sudnow was a *pilgrim* his microworld, in that the game he plays is a lonely one of the player versus the brick wall. Breakout is built around the sense of the player one day finishing it, as a singular achievement. There is no 'other' in the game as such (unless you count the designers), and here it differs fundamentally to the reliance upon the 'other' (real human others, in fact) within CS. The dynamicism of human others in CS games

ensures that the texture of the game continually evolves instead of being set in stone at the point of design, such as in Breakout.

In closing, we note that the aspects of skill that have been presented are only a beginning in the examination of what is involved in CS play. We do, however, hope they underline the complexities of what might seem at first glance a brutally simplistic game.

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