2.2   RELEVANT WORKS

2.2.1 – Introduction

So what lies beyond games that can offer some perspective on what character animation can do? This chapter looks at three important books on body language, traditional animation and acting, and analyzes how they might relate to animation in games…

Body language is a deep and complex subject and zoologist Desmond Morris is well-known for providing informative yet accessible insights into this field of study. His book *Peoplewatching* (2002) is a comprehensive guide to the psychology behind movement and made ideal research material for this project.

It would be tempting to delve into the advanced acting theory pioneered by Chekhov and Stanislavsky, and indeed this might prove a good source of further study, but for this project it was chosen to limit research to acting in animation specifically, a subject which is expertly tackled by acting teacher and animation enthusiast Ed Hooks in his book *Acting for Animators* (2003).

Frank Thomas and Ollie Johnston, two of the legendary "Nine Old Men" at the Disney Studio wrote a book that is widely considered to be the bible of animation, and is used by traditional (hand-drawn) animators and CG (computer graphics) animators alike to learn the great art of creating *The Illusion of Life* (1984).

Together these three books form a solid basis from which to develop ideas.
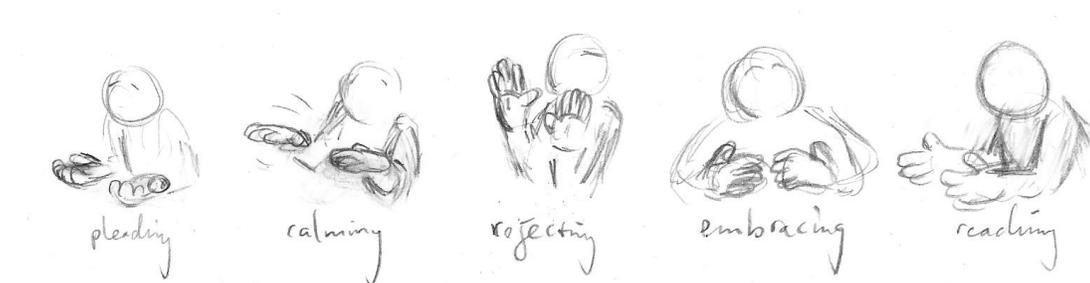
2.2.2 – Peoplewatching

"Wherever people behave, there the peoplewatcher has something to learn – something about his fellow men and, ultimately, about himself," (Morris 2002, p.15). What if you could learn this much from the movement of characters in games?

2.2.2.1 Gesturing

The first chapter of note in Peoplewatching covers the range of gestures we make as we speak to one another, referred to by Morris as "Baton Signals" (2002, p.78).

He talks at length about the very distinct, often rhythmic gestures people make while articulating their thoughts. Though primarily the tool of the public speaker, casual conversation too, is often underlined by elaborate gesturing.

If not always very specific in meaning, these gestures certainly add to what is actually being said. Consider the different ways in which the hands can be held in front of the chest:

Fig 2.11 Pleading, calming, rejecting, embracing and reaching (based on an illustration from Peoplewatching 2002, p.80, 81)

You could draw some interesting conclusions from just watching a pair of NPCs talk, even if you only catch snippets of conversation. Though it would be difficult to piece together a coherent dialogue, you could certainly make assumptions about the

relationship between the characters and how they feel about the subject they're discussing. It adds a whole new dimension to interactive eavesdropping…

2.2.2.2 Directions

Pointing someone in the right direction is a common human action, and increasingly (see chapter 2.1.3) it's becoming part of games. There are more subtle ways though, than just extending the index finger. One such way is the "Body Point", where a person turns his body to face a target (Morris 2002, p.88).

> "An experiment carried out in a busy American street revealed that if one person stood still, tilted back and stared at an imaginary object in the sky, 4 percent of passers-by would stop and look up."
>
> (Peoplewatching 2002, p.89)

Clearly this a great tool for the game designer to catch the player's eye. By carefully placing characters completely pre-occupied with something in the game world, the player will immediately be drawn to those things that seem to interest the NPCs so much.

A more intentional pointer, often coupled with a slight nod of the head, is the "Eyes Point" (Morris 2002, p.89), where a person stealthily glances at something, then back, to bring the attention of another to something without being noticed by a third party. It implies interesting social situations and could be used to alert the player to the arrival of persons to be avoided, or could hint at something important in a scene where discretion is of the essence.

Not as interesting perhaps but certainly very functional from an interactive point of view are gestures beckoning and repelling, or sweeping the arm sideways signalling the other to hurry up (Morris 2002, p.93, 95). These types of gestures could make for a useful vocabulary of navigational advice and could be put to good use in directing the player.

2.2.2.3 Friend or Foe

How do we tell our friends from our enemies? Most games operate under the assumption that anything that attacks you is an enemy and anything that doesn't probably isn't. This could be more subtle…

> "When two friends meet and talk informally they usually adopt similar body postures. … The friends in question are automatically indulging in what has been called Postural Echo, and they do this unconsciously as part of a natural display of companionship."
>
> (Peoplewatching 2002, p.120)

People automatically match their posture to those they feel comfortable with, but… just as this sense of well-being and friendship can be created by a change of posture, so it can be broken. Intentional or unintentional, those that adopt an alternate posture to the group not only isolate themselves… they actively destroy the group's "Postural Echo" (Morris 2002, p.121).
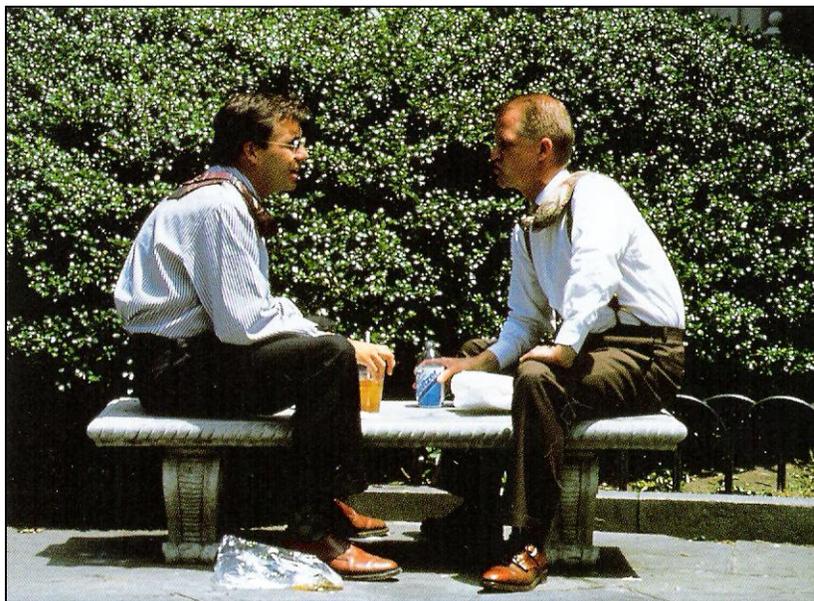

Fig 2.12 Postural Echo (Morris 2002, fig 26)

Though operating at a largely unconscious level, this is a very interesting phenomenon… one which could be used to subtly manipulate the player into liking certain characters in the game, by having them adopt similar postures to the player character. Conversely, differences in posture could be used to hint at animosity or indifference on the part of NPCs… [Note: It goes without saying that this would not work in a first person game.]

How much NPCs care about the player could also be shown in how bothered they are about greeting him. While a friendly character would go out of his way to meet you, another might make less of an effort, or none at all, content to sit and wait. And when it comes to the greeting itself, there is a world of difference between a hug and a handshake (Morris 2002, p.112-115).

2.2.2.4 Status

Our world consists of social hierarchies… a fact that is to varying degrees reflected in games. Between individuals of different stature there is often a clear exchange of dominant behaviour on the one hand and submissive on the other.
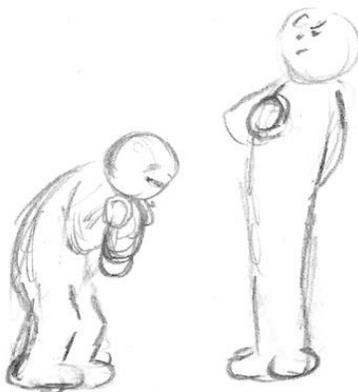
Fig 2.13 Submissive behaviour…

Submissive behaviour can be summed up as the act of making oneself small, the objective being to seem as non-threatening as possible. This is achieved "by curling up the body and lowering it in relation to the attacker" (Morris 2002, p.210). The 'attacker' in this case may be anything from an actual assailant to a social superior.

Eye-contact plays an important part in these social interactions. A subordinate does not hold the gaze of a superior. Instead he looks away, only briefly glancing at the other to check for reactions. A dominant individual could stare threateningly, or casually look away, ignoring his subordinate (Morris 2002, p.106)…

RPGs (Role Playing Games) tend to start with the player at the very bottom of the social ladder. Through patience and effort he can hone his skills (usually in combat) and gradually gain power and recognition. You could have a game where, as you start out, you have to be respectful to your superiors and adopt appropriately submissive behaviour to assure their approval; nodding, bowing, etc… *but* as you rise to power you're able to interact on more equal footing and increasingly command respect from others… In the Darwinian societies that games often depict this could be an interesting element of play.

If you were to design a game around eye-contact it would probably have to be in first person as the mouse-controlled navigation that entails is a fairly good approximation of looking around. The centre of the screen would read as the focus and depending on where the player looks and for how long, NPCs react differently. In turn, these characters should look at the player and other characters in a way that suits their attitude towards them…

2.2.2.5 Truth

Lies and honesty; what are they really thinking? How can you trust a game character? Then again… what reason would there be to distrust one?

As part of the narrative, NPCs in some games might not necessarily be telling the truth.

It follows that if this deception is part of the gameplay, so is the player's ability to recognize it. But this can only work if there are signs for the player to recognize…

When a person aims to deliberately deceive, there are many signs that hint at the conflict within. A series of studies discussed by Morris (2002, p.152-161) found that liars tend to gesticulate less than they would normally, with the exception of the hand-shrug gesture, which was used more frequently. They touch their face in an effort to seek comfort and shift uneasily in theirs seats, wanting to escape their predicament. Despite their efforts to lie with their face as well as their words, fleeting expressions of genuine emotion can be seen flickering briefly across the face, and the eyes shift nervously, avoiding the listener's gaze, but checking constantly for reactions.

And there are other activities that signal stress and could be seen as an indication that the speaker is not being truthful… So called "Cut Off", shutting out the world by closing the eyes or looking intently away, and "Displacement Activities", trivial actions that merely serve to avoid inactivity (Morris 2002, p.242-244, 266-270)…

Now, if a character in a game were to act like this, a perceptive player would find ample cause to take his words with a hefty grain of salt. This deception could be a specific part of the game's narrative, but it could just as well be a regular occurrence; rogue traders trying to con you out of your hard earned cash, rivals pretending to be your friend, meanwhile poised to stab you in the back… There are many situations in which lies could be a very interesting part of gameplay indeed.

2.2.2.6 Gender

Men and women move very differently. There are both anatomical and cultural reasons for this and Morris goes into some detail describing them; from swaying hips to "wrist-flapping", the distinction is clear (2002, p.348-362).

It is difficult to see the use of basic differences in movement between men and women in a game situation as you would expect the difference to be apparent from a still picture and, indeed, whether identifying the sex of game characters would be in any way helpful at all is arguable…

However, with a stretch of the imagination, you could envision a situation where a woman might be disguised as a man or vica versa, the objective of the game being to unmask this impostor. Immediately you have an interesting gameplay element based on animation…

2.2.3 – Acting for Animators and The Illusion of Life

"Acting is reacting" (Hooks 2003, p.3); a character acts in reaction to the things that happen around him and how he feels inside. A character that reacts is believable because he seems part of the world he inhabits, and more importantly, a character that reacts is a character that's *interactive…*

2.2.3.1 Perceivable thought

The Illusion of Life describes how in the 1930s, the animators at Disney discovered that you could show a character thinking through changes in facial expression.
The flypaper sequence in *Playful Pluto* (Disney 1934), animated by Norm Ferguson, starts with a happy expression on Pluto's face and turns to a look of surprise, then worry, as he realizes what he's sitting on. He frowns angrily as he tries to get rid of the flypaper. The changing facial expressions show Pluto's changing emotions as he contemplates his predicament (Thomas and Johnston 1984, p.100, 101).

Fig 2.14 *Playful Pluto* (Thomas and Johnston 1984, p.101)

"When the character has a new thought or has a realization about something during the scene, he will change from one key expression to another, with the timing of the change reflecting what he is thinking. If the thought process is a sudden realization, then it will be a quick change. If it involves a scheming action, the movement will be slower."

(The Illusion of Life 1984, p.464, 466)

Many games incorporate conversation into gameplay in the form of a dialogue tree that allows you to pick what to say to the characters in the game. Facial expression could be used as feedback to the player, showing the reactions of the NPCs the player talks to. If a character frowns in response, the player could adopt a different approach in pursuit of a more positive reaction, or he could continue and risk further upsetting the character. If the player asks a question, the NPC could respond right away… but he could also look away thoughtfully before giving a considered reply. If a character responds too quickly to a question that would normally require some thought this should send up warning flags with the player, alerting him that the response might not be genuine. The amount of time it takes for an NPC to 'remember' something might also be used as a clue to how well-informed that character is.

"Thinking tends to lead to conclusions; emotion tends to lead to action," Hooks says in the first chapter of *Acting for Animators* (2003, p.1). Even if there is no careful consideration going on, there is still a thought process. If a character notices a rampaging monster, the mind determines that this could be dangerous. Most likely the resulting emotion will be fear, and this fear then triggers an action… like fleeing.

In games, the way AI usually works, an NPC will do one action and then switch instantly to a different action as it becomes necessary. You don't see game characters doing one thing, then thinking of something else and going off to do that, or deciding as they're doing one thing what they're going to do next.

> "A lot of valuable points could be brought out to the men in showing them that it is not necessary for them to take a character to one point, complete that action completely, and then turn to the following action as if he had never given it a thought until after completing the first action, anticipation of action is important."
> (Memo from Walt 1935, p.9)

If the player could see characters thinking, he could react to the decisions they appear to be making. Gaze direction is a great way of showing this. We tend to look at things

before we interact with them, be it something or someone. Having NPCs purposefully looking at things would allow the player to second-guess their thought process.
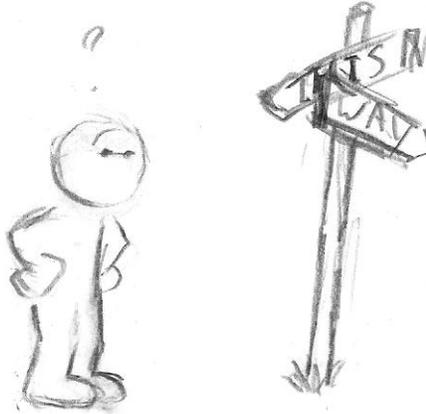
Fig 2.15 Decisions, decisions…

When a character isn't sure what to do, he does not show this indecision by doing nothing. He switches decisions: doing one thing, then changing his mind and doing the other, back and forth (Hooks 2003, p.83). If the player came across such an indecisive person he could perhaps help him by giving advice. This way the character's movement sets up a problem for the player to solve. You could arguably make the same point through dialogue - "I can't decide whether to go left or right." - but it's made much stronger if the character can be seen looking down one path and perhaps taking a step, then looking the other way and changing direction, only to stop again. The dialogue becomes merely a confirmation of what the player has already realized.

2.2.3.2 Context

A character's behaviour should not just be a reflection of how he's feeling at the time. Hooks explains in his book that "scenes begin in the middle" (Hooks 2003, p.32). Whatever the situation, something happened before it, and something is going to happen after it. This past and future has a profound effect on the present.

You see a character running in a game… Where did he come from? Where is he going? What's his goal? How the person runs will differ dramatically depending on the answers.

If he is late for a meeting, he will run differently than if he's running to escape the police, or if he's running just for exercise. By showing this in the animation, the player can be told not just the story of the characters, *but how to interact with them*. If the player has a vehicle, he could give the tardy person a lift. If he's a law enforcer, he could help chase the fugitive. The action the player chooses to take will differ depending on how the character is animated.

2.2.3.3 Anticipation

The purest visual form of intention, "Anticipation" is the physical preparation for action, the crouch before the jump… It is the second principle of animation.

> "Before a man runs, he crouches low, gathering himself like a spring, or, the reverse, he draws back in the opposite direction, raising his shoulders and one leg, as he aims himself at the place of the next activity."
>
> (The Illusion of Life 1984, p.52)

Fig 2.16 Anticipating a kick, then kicking.

Anticipation prepares the audience for what's about to happen. It can warn the player of imminent danger, or otherwise alert him to something he may wish to prepare for.

Anticipation of attacks is widely used in games, with enemies announcing their attacks with a particular pose or movement… but there other ways in which anticipation could be used interactively. If a sitting character is about to leave he can show this intention by leaning forward to get up. He may not immediately finish the movement, but his starting it clearly communicates a desire to leave (Morris 2002, p.258)… or it could be something more subtle, an intake of breath before speaking for example; if an NPC appears to have formulated a response, but doesn't utter it, the player could take the initiative and ask: "I'm sorry, did you want to say something?"

2.2.3.4 Personality

Different people call for different approaches. We each have our own way of moving that mirrors who we are. Hooks describes in his book how the way people move is affected by the placement of their "power centers":

> "An anxious person has a power center in his head. Think of Woody Allen or the comedienne Joan Rivers… Allen's a nervous wreck, a man with a very heady energy, a high power center; Bogart, a man's man, has a very low power center, is unflappable."
>
> (Acting for Animators 2003, p.65)

The power center is the focus of a character's movement, the part that drives him forward. Shifting its position can completely change a character's appearance. Naturally, showing the character of NPCs in animation is a great way to tell the game's story. Personality is of more than just narrative interest however…

If NPCs are different characters, why should they be interacted with the same way? For example, if someone has an extremely volatile personality it might be wise to handle with care if any information or help is to be obtained… Then again, it might in fact be better to exploit this explosive temper and set it off, perhaps to create a distraction, or indeed to trick the person into saying things in anger they would not have said otherwise.

A tough guy might need impressing, either through bluff or achievement. A vain person could be persuaded by flattery, and so on… This way, by identifying NPCs' characteristics (based on how they move) and then exploiting them, the player can progress further into the game…

2.2.3.5 Attention

In character-based games the player often spends a great deal of time talking to others. One has to assume that they generally pay attention, but what if an NPC could indicate his lack of interest in a conversation?

If someone is listening to what you're saying, they don't just stand there. They look away thoughtfully, taking in what's being said, they make eye-contact, they nod… and occasionally they might think of something to say and open their mouth to speak, but decide against it (Hooks 2003, p.77). Lack of these signals could be used to insult the player and make him dislike a character, or it could be used to indicate to him that he needs to try harder to grab the character's attention. The player could try talking about something else and if the character suddenly starts actively listening, the player knows he is on the right track.

2.2.3.6 Staging

The third principle of animation, "Staging" is about creating a scene that *reads*.

> "It is the presentation of any idea so that it is completely and unmistakably clear. An action is staged so that it is understood, a personality so that it is recognizable, an expression so that it can be seen, a mood so that it will affect the audience."
> (The Illusion of Life 1984, p.53)

In animation, clarity is needed to tell a story effectively. In games it is of even greater importance. When it comes to things directly concerning gameplay, it's crucial that any information given to the player be clear, as it is usually a matter of life and death…

There are some problems with this.

Firstly, silhouette, one of the key tools of staging, does not work so well in games, simply because most game characters can be seen from any angle. A character would have to turn with the camera in order to preserve his silhouette. Strong poses are still possible, but they have to work in all three dimensions.

Secondly, Thomas and Johnston warn to "avoid making a fast move while changing the expression [on a character]" (1984, p.471), but that is easier said than done when the camera is in the hands of the player. Unless he deliberately stops to watch an NPC he is probably not going to notice any subtle changes in motion as he walks past.

In order to catch the player's attention, actions need to be exaggerated with stronger poses and motion to make the most effective statement possible (the "Exaggeration" principle) and there can be only one action at a time. A character has to be doing one thing, communicating one idea, or the audience will not get it (Thomas and Johnston 1984, p.56, 65). "Secondary Action", another animation principle, can be used to add further detail to the movement:

> "Often the one idea being put forward can be fortified by subsidiary actions within the body. A sad figure wipes a tear as he turns away. Someone stunned shakes his head as he gets to his feet. A flustered person puts on his glasses as he regains his composure. When this extra business supports the main action, it is called a Secondary Action and is always kept subordinate to the primary action."
> (The Illusion of Life 1984, p.63, 64)

These small actions can be used to show mannerisms and add depth to a character's personality or simply to clarify the primary action. You could combine a broad main action with subtle secondary actions to create a balanced but effective whole.

The question of clarity versus subtlety is a difficult one… Do you risk ruining the atmosphere with obvious over-acting, or do you keep the animation subtle in the hope that the player will notice anyway, if only subconsciously?

Mr Hooks pointed out in a discussion during his "Acting for Animators" workshop at Teesside animation festival Animex 2005 that by using very specific poses and motions to communicate ideas, you run the risk of getting into pantomime more than acting, "indicating" an emotion rather than expressing it (Hooks 2003, p.69).

This same issue was later put to game designer Ernest Adams (at the same festival). He felt that once social interaction in games reaches a greater level of complexity it would be worthwhile to incorporate more subtle movement into character interaction, but for the moment more symbolic acting should suffice as the current level of subtlety behind the scenes doesn't really require anything beyond that.

2.2.3.7 Games

Though *Acting for Animators* focuses on acting as it applies to animation in film, Hooks does also briefly cover acting in games specifically…

He looks again at some of the ideas put forward in his book and applies them to games. For example, game characters should "play an action until something happens to make [them] play a different action", so when the player enters the scene they should not just be standing there waiting for his arrival; they should be going about their business until they are interrupted…

Characters "should react to the reality of whatever the other characters are doing" and acknowledge both the actions of the player and their fellow NPCs (Hooks 2003, p.106).

Finally, *empathy*, the audience's sharing the emotions of the characters on screen…
While difficult to achieve with the player character due to the direct control the player
has over it, empathy can be achieved by making the player feel for the *other* characters in
the game; sidekick or buddy characters that accompany the player but are outside his
control can inspire affection in the same way that film characters can because of the
distance between them and the player (Hooks 2003, p.104).

2.2.4 – Conclusion

These books show that there is a lot to be learned from fields not directly part of the
games industry. Reading and re-reading them, considering every angle and possibility has
(as is evident from this chapter) helped to inspire a wide range of ideas for game
animation, many of which are further explored in chapter 3…

Not all parts of these three books were relevant to the project however, and subjects such
as cultural history, evolutionary theory (Morris 2002), "Laban Movement Theory", the
actor's working process (Hooks 2003) and the history of Disney (Thomas and Johnston
1984) had to be left out of the analysis, because as fascinating as they are, they would not
have added anything to the discussion of interactive animation.