

The Monstrous Brain: A Neuropsychanalytic Aesthetics of Horror?

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Abstract

Psychoanalysis touches many aspects of the 'two cultures' which seem so hard to reconcile and some analysts oppose neuropsychanalysis as a dangerous biologizing of the mind (Blass and Carmeli 2007). It may seem that psychoanalytic applications to art and neuroscience are contradictory and pulling in opposite directions. However, the groundwork for a neuropsychanalytic aesthetics has already begun (Oppenheim 2005, Holland 2003, 2007). Horror seems particularly appropriate for this interdisciplinary project, as it is prototypically a 'body genre' (Williams 1995) privileging affective bodily participation, and the centrality of powerful basic emotions such as FEAR (Panksepp 2004). Psychoanalysis has always had an affinity with horror (Day 1985, Schneider 2009, Creed 1993, Freud 1919, Jones 2008) but is increasingly challenged by new cognitive science approaches (Hasson et al. 2008, Price 2009). This article seeks to bring findings and methods of neuroscience into psychoanalytic film theory, and proposes a neuropsychanalytic research programme into (horror) film spectatorship. Based on a presentation made at the tenth International Neuropsychanalysis Congress, Paris 2009

I. Psychoanalytic Aesthetics and Neuropsychanalysis: Opposing Representatives of the 'Two Cultures'?

Horror Films serve as a barometer of those things which trouble the night thoughts of a whole society (Steven King 1981, 131)

Psychoanalysis touches many aspects of the 'two cultures' which seem so hard to reconcile, and one particularly controversial recently emerging field is neuropsychanalysis. Many psychoanalysts oppose the neuroscientific tendency as a dangerous biologizing of the mind (Blass and Carmeli 2007), some fear it may lead to turning away from fascinating interdisciplinary work in aesthetics (Glover 2008), film/literary criticism (Wright 2000, Sabbadini 2007) and cultural/social theory (Clarke 2003). It may seem that psychoanalytic applications to art, film and culture on the one side, and to neuroscience on the other, are contradictory and pulling in opposite directions, representing the maximum tension between

the 'two cultures', a kind of 'split-brain' (Gazzaniga 2008) for psychoanalysis and academia.

Recently characterised by Georg Northoff (2007) as “the nodal point between philosophy and the neurosciences”, neuropsychanalysis is a rapidly developing new interdisciplinary research field, encouraging dialogue between researchers from a variety of disciplines interested in the mind/brain: psychoanalysis, cognitive and affective neuroscience, psychology, psychiatry, psychopharmacology and attachment research. It can also be viewed as one important response to the so-called crisis of psychoanalysis, helping to begin to answer the Popperian charge by increasing the empirical support for many basic psychoanalytic propositions which can now no longer be deemed in principle unfalsifiable and therefore unscientific (Popper 1959). These include areas as diverse as dream theory (Solms 2003), defence mechanisms (Ramachandran 1994, Northoff and Boeker 2006), infant (Stern 2000) and child development (Mayes, Fonagy and Targert 2007), object relations and attachment (Gerhardt 2004, Green 2003, Cozolino 2006), emotions (Panksepp 2004), psychotherapy (Cozolino 2002), the self (Schore 1999, 2003a,b), consciousness (Damasio 2000, Solms and Turnbull 2005), and the unconscious (Mancia 2006, Shevrin *et al.* 1996).

In some sense the neuropsychanalytic project is as old as, or even older than, psychoanalysis itself, with Freud publishing over 300 neuroscientific papers before he 'invented' psychoanalysis and making several important contributions to the field (Gamwell and Solms 2004). Despite reluctantly abandoning his own 'neuropsychanalytic' *Project for a Scientific Psychology* (Freud 1950) after realising integration between psychoanalysis and biology was premature given the primitive neuroscience of his time, Freud always retained a hope that such an integration would prove possible in the future (Freud 1920). The separate and often antagonistic paths of psychoanalysis and neuroscience during the twentieth century need not be explored here, and it is only recently that advances in neuroscientific theory and especially methodology have allowed for the possibility of renewing this dialogue.

As well as breathing new life into many aspects of psychoanalysis, psychoanalytically oriented articles are now being published in numerous mainstream neuroscientific and cognitive journals which previously would have had little chance of acceptance. The barriers (including institutional barriers) between disciplines are still formidable but perhaps they do not seem

quite as firm as they once did. This journal epitomizes the new spirit of openness with its inclusion of neuroscientific and cognitive articles alongside psychoanalytic ones, a policy we may hope does not remain as unique as it is today. In addition to the gains psychoanalysis can make from this project, neuroscientists (Kandel 2005, Panksepp 2004, Ramachandran 2004, Sacks 2005) are now looking for a more holistic and dynamic model of the mind/brain which can help to make sense of the overall picture from their rapidly, almost exponentially, growing body of findings, and psychoanalysis with its rich and detailed theory and clinical practice has much to offer. It is also proving a new fertile ground for research into psychological and neurological disorders (Panksepp 2003; Cozolino 2002; Stora 2007; Mayes, Fonagy and Target 2007).

Mark Solms and Oliver Turnbull (2003) attempt to ground the neuropsychanalytic project philosophically in terms of the 'dual-aspect monist' position within the philosophy of mind. Here it is argued that mind and brain are fundamentally the same thing (monism), looked at from different perspectives (dual-aspect). When looked at from the third person position, from the outside, we see a brain, and neuroscience along with experimental psychology are the best tools for studying this aspect. Studying the mind/brain from this objective third-person perspective has its own particular advantages and disadvantages. However, unlike other objects in the universe, the mind/brain can also be studied from 'within', from the first person perspective of what it feels like to be a mind, a living experiencing subject.

This is the perspective of psychoanalysis, arguably the pre-eminent science of subjectivity, with all the advantages and disadvantages that its own epistemological position brings. Therefore, from a dual-aspect monist perspective, neuropsychanalysis seems a logical research position if we really want to know what the mind is, with each method offering something important, helping to compensate for the blind-spots and limitations of the other. This position should not be seen as obligatory for neuropsychanalysis, and indeed many researchers dispute this strongly. Even without accepting the dual-aspect monist perspective (eg. from an emergentist or other perspective), the dual-approach to studying the mind has many merits methodologically, conceptually and pragmatically.

However, some have argued that neuropsychanalysis seems to be on one extreme wing of the 'two-cultures' divide which cuts across psychoanalysis, with approaches to society and art being on the other wing, with the clinic somewhere in between. Just the word 'neuro' can cause strong responses from those understandably wary of 'essentialist' positions. Others accept that neuropsychanalysis is interesting in a limited 'scientific' sphere but is irrelevant, misinformed, or even dangerous outside this. However, I wish to argue that to the extent that neuropsychanalysis helps improve our understanding of the mind/brain, it has relevance to all fields of applied psychoanalysis which utilize psychodynamic models of the mind. It may even be that by focusing specifically on the areas of seeming greatest contradiction, the strengths and limitations of applied neuropsychanalysis will be most apparent.

II. A Neuropsychanalytic Aesthetics?

While one of the benefits of neuropsychanalysis is therefore its attempt to reach across seemingly impregnable disciplinary boundaries, could this reach so far as to span the 'two-cultures' split between the sciences and humanities? Is it possible to bring advanced perspectives from psychoanalytic (film, literary, cultural) criticism into the neuropsychanalytic project, and to connect psychoanalytic film theory with modern brain research?

This at first seemingly omnipotent desire to overcome the split is captured well in the suitably horrific image of Goya's (1799) *The Sleep of Reason Produces Monsters*. Usually this is read as a defence of reason against the dangers of irrationality and fantasy and may seem to wish to maintain strict borders between the two, and to



Goya, 1799. *The Sleep of Reason Produces Monsters*. "Fantasy abandoned by reason produces impossible monsters: united with her, she is the mother of the arts and the origin of their marvels".

praise science and reason over imagination. However, not usually included is the subtitle to this work, which is that “Fantasy abandoned by reason produces impossible monsters: united with her, she is the mother of the arts and the origin of their marvels”. This could almost stand as a coda for the neuropsychanalytic project, with its attempt to unite the objective and the subjective, reality and phantasy, neuroscience and psychoanalysis, at least as far as this current work on the neuropsychanalytic aesthetics of horror is concerned. And like horror, Goya's painting is actually far more ambivalent than it first seems.

The 'dual-aspect' monist position on the philosophy of mind of many leading neuropsychanalytic researchers (but by no means all, this is still a question unlikely to be definitively answered in the near future if ever) might well lead to the conclusion that in order to truly understand the phenomenon in question, in our case art and film which are complex creations of the human mind/brain mediated by culture and environment, we actually need ideally to bring together the advanced methods and theories of both sides of the 'two-cultures' divide. Therefore it can be argued philosophically, as well as theoretically and methodologically, that bringing psychoanalytic aesthetics and film theory in connection with neuropsychanalysis may be a strategic and productive move.

In fact neuropsychanalysis itself starts to break down some of the old binaries between the 'culturalist' and 'essentialist' positions (or caricatures). One key argument of this paper is that neuropsychanalysis is not incompatible with more socio-cultural or qualitative approaches within applied or clinical psychoanalysis. On the contrary, neuropsychanalytic findings help to show the historicity and the deeply social nature of the brain/body itself, how the 'bedrock' of biology is itself responsive to social, historical and environmental contingencies. Developmental neuroscience and neuroplasticity studies (Ansermet and Magistretti 2007) have made this increasingly clear, allowing a certain rapprochement between traditionally highly antagonistic fields.

The compelling if initially strange idea of a neuropsychanalytic aesthetics was proposed by Lois Oppenheim (2005) in *A Curious Intimacy: Art and Neuro-Pschoanalysis*, which focusses on the neurobiological underpinnings of affect and the self, and the importance for this in the

biology of the creative process and aesthetic experience. Oppenheim suggests a general framework from which a neuropsychanalytic aesthetics might begin, based on the intriguing idea that creativity is rooted in the biological principle of homeostasis and improves psychological and bodily self-awareness and psycho-somatic integration. The author then draws upon psychoanalytic feminist theories to explore the biological and psychosocial aspects of gender and their relation to creativity, before applying her thesis in the context of literature (Samual Beckett), painting (Paul Klee) and dance (Martha Graham).

While aspects of the author's thesis are potentially problematic (see Smolen, Watt and Rose 2006) Oppenheim's work is important as it represents the first major book length attempt to inaugurate a neuropsychanalytic approach to aesthetics. Another important writer in this area is Norman Holland (2003, 2007) who has written interesting papers on topics such as the suspension of disbelief in art and literature, and on laughter, humour, jokes and tickle from a neuropsychanalytic perspective. His new book-length approach to the subject, *Literature and the Brain* (Holland 2009) looks set to be the benchmark for neuropsychanalytic works on literature for some time to come. His work provides a model by which advanced approaches in psychoanalytic criticism can be integrated with the cutting edge of brain science.

The groundwork for a neuropsychanalytic aesthetics has therefore already begun, but the project is still in a very preliminary stage, and to the author's knowledge it has not yet been applied in the context of psychoanalytic film theory. Here, instead of attempting a more general approach, by narrowing the focus the potential benefits of a neuropsychanalytic aesthetics might become more apparent. Horror seems particularly appropriate for this interdisciplinary project, as in addition to being perhaps the most quintessentially psychoanalytic area of film it is before all others a 'body genre' (Williams 1995) which privileges audience affective bodily participation, and of course the centrality of powerful basic emotions which have been studied neuroscientifically and neuropsychanalytically such as FEAR (Panksepp 2004) and disgust (eg. Blechner 2005).

The horror film therefore proves to be an interesting candidate in aesthetics to investigate from the point of view of psychoanalytic film theory, neuroscience, and other 'cognitivist' approaches. The aim of what follows is not to argue for or against different psychoanalytic

perspectives on horror, but to introduce key concepts and suggest that in principle they can be made to yield testable hypotheses, along with some psychobiological methodologies and findings in horror film research which may be relevant to this interdisciplinary project.

The horror genre is an exploration of many of our deepest anxieties, which can be interpreted psychoanalytically, including “uncertainty of bodily boundaries, fragmentation, being under a constant threat” which Urbano (2009) relates to Freud's second anxiety theory; sexual anxieties of different psychosexual stages (castrating father, engulfing mother); and issues around repression, repetition and the death drive, persecutory paranoid-schizoid anxiety (annihilation, fragmentation, dismemberment, destruction, engulfment, retaliation, biting/clawing, poisoning); depressive anxiety (guilt, a destroyed and desolate inner world, death – Klein and Mitchell 1987). Both paranoid-schizoid and depressive anxiety, referring to the Kleinian 'positions' of the same name, can be related to specific, and neurologically distinct, brain systems, the FEAR and PANIC systems respectively (see below for more details).

Horror also explores fears of 'madness' itself (Fuery 2003), and as Winnicott (1974, 104) wrote, the “fear of breakdown is *the fear of a breakdown that has already been experienced...a fear of the original agony which caused the defence organization which the patient displays*”. Thus horror often directly draws on psychoanalytic themes, and in addition horror is fascinated by neuroscience, brains and the relationship of our psychological selves to the flesh of our bodies, blood, bones and brains.

II. Gothic Freud and the Uncanny

the [horror] genre itself invokes psychoanalytic considerations, at times borrowing its imagery from the symbolic apparatus of dream interpretation (Andrew Tudor 1997, 55)

There is a large existing psychoanalytic literature on horror going back to the first generation of psychoanalysts, from Freud's (1919/1990) *The Uncanny* and Marie Bonapartes' (1971) work on E.A. Poe, to Otto Rank's (1989) book *The Double: A Psychoanalytic Study*, and Ernest

Jones' (2008) *On The Nightmare*, which as well as discussing nightmares provides an early analysis of witches, vampires, werewolves and the Devil. The latter also was dealt with by Freud in his *A Seventeenth-Century Demonological Neurosis* (1923), an analysis of the real case of Christopher Hartzmann, an unsuccessful painter who believed he had sold his soul to the devil and thereafter was in need of exorcism. This relates to later research on the psychoanalysis of the European witch trials, in works such as *Oedipus and the Devil: Witchcraft, Religion and Sexuality in Early Modern Europe* (Roper 1994) and *Witches: A Psychoanalytic Exploration of the Killing of Women* (Heinemann 2000).

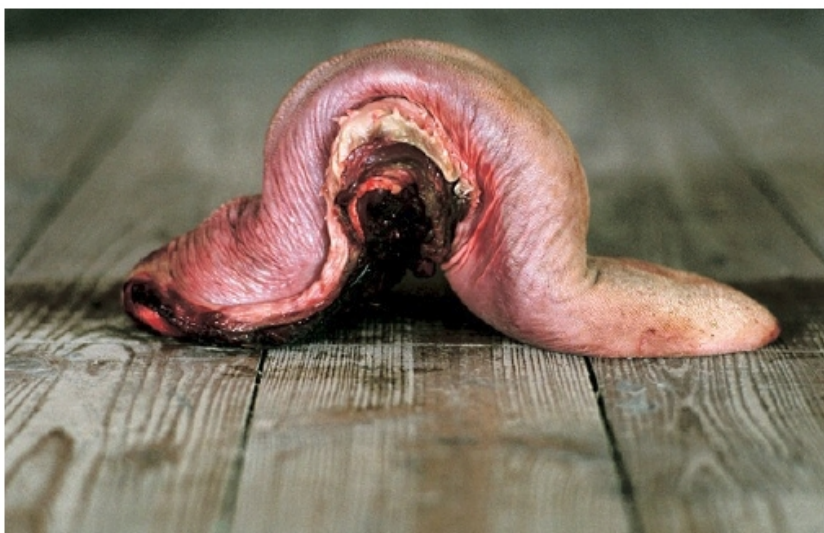
Psychoanalysis has always had a particular affinity to horror and the Gothic. "No discussion of the Gothic can avoid discussing Freud; one of the most obvious ways of thinking about the genre is to read it in terms of Freud's system", argues William Day (1985, 177), whose thesis suggests that the "striking parallels between Freud's thought and the Gothic fantasy" are far from random, both having "a common, or at least related, origin" in "responses to the problems of selfhood and identity, sexuality and pleasure, fear and anxiety as they manifest themselves in the 19th and early 20th centuries." In both the Gothic genre and psychoanalysis, we see the construction and constriction of the self in/by the family, conflicts between sexual desire and its repression, and anxiety of the boundaries of identity between animal/human, man/woman and alive/dead. Both also emphasize of the importance the inner world of subjective experience and a subversion of linear plot structures by mechanisms of transformation, condensation, projection and displacement (Scheider 2009). Similarly Barbara Creed (2009, 188) points out the horror-aesthetic of Freud's writing:

Castration, sexual abuse, perversity, excrement, bestiality, animal phobias – Freud's case histories read like horror movies. They are alive with fears – fear of being bitten by a horse, fear of wolves, fear of having one's bowels gnawed by a rat. His famous *Interpretation of Dreams* is permeated with anxieties and phobias of a similarly horrific nature – nightmares of falling, suffocation, ghosts, dead children, burning skin, urine and feces, people with bird's heads, snakes, men with hatchets, decapitations. In Freud's view, nightmares were the result of wish fulfilments from the unconscious, deadly dreamscapes of sexual origin in which he included murder and cannibalism.

Freud's (1919, 219) *The Uncanny*, one of the most influential theories in psychoanalytic approaches to horror, is based on one of his longest pieces of literary analysis, of E.T.A Hoffmann's gothic novel *The Sandman*. The uncanny is "related to what...arouses dread and

horror” and arises when something seems paradoxically both frighteningly alien and strangely familiar, when something of someone reminds us of a repressed, projected or split off aspect of ourselves. Typical themes include the animate/inanimate (including the doll), automatism, doubles, phantasies of bodily disintegration and merger, being burned alive and “Dismembered limbs, a severed head, a hand cut off at the wrist...all these have something peculiarly uncanny about them, especially when...they prove capable of independent activity...this kind of uncanniness springs from its proximity to the castration complex.”

The use of objects by the Czech surrealist, filmmaker and animator Jan Švankmajer are a clear example of a film maker utilizing Freud's uncanny to achieve remarkable emotional effects. In *Lunacy* (Švankmajer 2006), a film inspired by E.A. Poe and the Marquis de Sade, the main live action sequences are interrupted briefly throughout the film with animated meat, part-objects moving by themselves.



Lunacy (Jan Švankmajer 2006). Švankmajer's unique use of objects are a clear example of a film maker utilizing Freud's uncanny to achieve remarkable emotional effects.

Švankmajer's whole oeuvre can perhaps be read in part as a homage to the Freudian uncanny. Another key theme of the uncanny is the grave/womb. This is also utilized in Švankmajer in films such as *Lunacy* (Švankmajer 2006) where the Marquis arranges to be buried alive so he can face his fear but also out of a perverse pleasure all too familiar to horror film spectators) or in *Punch and Judy* (Švankmajer 1966), where Punch repeatedly kills Judy and hammers the nails into her coffin before she breaks free and escapes and retaliates in kind), their mechanical puppet-like universe ruled by envy and greed is contrasted with the live animal they fight over, a guinea-pig, who ends up leaving the set (and his masters) through a hole in the mouth of a face painted on the back screen. There is nothing enlivening about Punch and Judy's 're-births' they are more like automatism, as with Slavoj Žižek's understanding of *Thanatos* (Žižek 2004, Fiennes 2006) which he sees as exemplified in the

theme of the *undead*. And of course puppets and automatism are another key trope in Freud's *The Uncanny*, as well as interestingly in his analysis of the comic (Freud 1905), a theme we shall return to at the end of this paper. The terror of the grave/womb is described well by E.A. Poe (1998, 1) in *The Premature Burial*:

To be buried while alive is, beyond question, the most terrific of these extremes which has ever fallen to the lot of mere mortality...There are moments when, even to the sober eye of Reason, the world of our sad Humanity may assume the semblance of a Hell-but imagination of man is no Carathis, to explore with impunity its every cavern. Alas! the grim legion of sepulchral terrors cannot be regarded as altogether fanciful...they must be suffered to slumber, or we perish."

Freud (1919, 244) comments precisely on this fear:

To some people the idea of being buried alive by mistake is the most uncanny thing of all. And yet psychoanalysis has taught us that this...is only a transformation of another phantasy which originally had nothing terrifying about it at all, but was qualified by a certain lasciviousness, the phantasy...of intra-uterine existence...It often happens that neurotic men declare that they feel there is something uncanny about the female genital organs. This unheimlich place...is the entrance to the former Heim [home] of all human beings, to the place where each one of us lived once upon a time and in the beginning...the unheimlich is what was once heimisch, familiar; the prefix 'un' is the token of repression.

This analysis opens up a more general trope of the grave/womb, which has been further studied by Creed (1993) as an aspect of the monstrous-feminine prominent in films such as *Alien* and *The Brood* which portrays female reproductive capacities as monstrous and sites of death and abjection (Kristeva 1982). The grave/womb is also explored in a different way by Bakhtin (1984) in his study of carnival in the context of the writings of Rabelais, where the creative/destructive theme of the grave/womb which kills and gives birth is linked to the grotesque body of carnival with its "lower bodily stratum". This approach proves useful later when we relate horror and the comic. According to Bakhtin (1984, 25), in contrast to the "classical body", grotesque bodies are "ambivalent and contradictory; they are ugly, monstrous, hideous from the point of view of 'classic' aesthetics, that is, the aesthetics of the ready-made and completed". Unlike the classical body, the grotesque body is not cut off from the world. To illustrate this image Bakhtin (1984, 26) chose the Kerch terracottas, depicting pregnant senile, laughing old hags:

It is pregnant death, a death that gives birth. There is nothing completed...calm and stable in the bodies of these old hags...Life is shown in its two-fold contradictory process; it is the epitome of incompleteness...[The grotesque body] is unfinished, outgrows itself, transgresses its own limit. The stress is laid on those parts of the body are open to the outside world, that is, the parts through which the world enters the body or emerges from it, or through which the body itself goes out to meet the world... the open mouth, the genital organs, the breasts, the phallus, the potbelly, the nose.

One can already see images of horror here celebrated in Bakhtin's carnival. Bakhtin's writings on the horrors and pleasures of the grotesque may fruitfully be added to Freudian conceptions of the uncanny and the abject monstrous-feminine of Creed/Kristeva to emphasize the ambivalence of such imagery and themes, most strikingly in the comic aspects of horror. Horror and uncanniness are not merely frightening, they are also something very close to us that we are drawn irresistibly towards. The frightening and repelling aspect is not separate from desire. In fact, psychoanalysis has consistently shown it is often precisely our desires that we are most afraid of. The philosopher and psychoanalyst Slavoj Žižek tries to capture this seeming contradiction in the film *The Pervert's Guide to Cinema* (Fiennes 2006) by stating that another name for desire realised is 'nightmare'.

Desire and dread are closer than we think, a finding which is interestingly supported by recent neuroscientific research (Berridge *et al.* 2008, and see section VII below). This concept remains essential to psychoanalytic attempts to deal with one of the key issues in horror scholarship, the paradox of why anyone ever willingly goes to see horror films in the first place. Why does the Marquis in Švankmajer's (2006) *Lunacy* ask his servant to bury him alive before later digging him up from the graveyard? Why does the hero of the film follow the servant and watch, fascinated-and-horrified, the macabre proceedings? What are we doing in the cinema watching this?

III. Horror in Psychoanalytic Film Theory

Freud's Death Drive is close to what is called in horror films and Steven King novels, the 'undead' (Slavoj Žižek, 2004)

Otto Rank's (1909) *The Double* includes possibly the first psychoanalytic commentary on any film, the silent German expressionist horror *The Student of Prague* (Wegener 1913) where a poor student makes a pact with a stranger for money in exchange for anything in his room. The pact is made, the stranger calls the student's reflection which walks out of the mirror and goes on to kill (people the student may have really wanted to kill) and attack a woman (who the student has passionate feelings about). The student is horrified and eventually kills his double/reflection, thus killing himself, but as he dies he turns sees his reflection again, in the mirror.



Above: *Student of Prague* (Wegener 1913).
Below: *The Dead Don't Talk AKA: Oluler Konusmaz Ki.* (Yalinkilic, 1970)

This classic Gothic form (Wegener 1913, Poe 1839, Dostoevsky 1846) is still an important theme in horror today. For example it occurs with an interesting twist in *Fight Club* (Fincher 1999), where wishing to avoid this fate, Edward Norton instead shoots himself and thus kills his double, Brad



Mental Doubles: An American Werewolf in London (J. Landon, 1981).
Fight Club (Fincher 1999)

Pitt. Rank connects the double with shadows (see also Jung 1951), guardian spirits, belief in the soul, fear of death and reflections in mirrors (a theory which opens up further possibilities for exploration in terms of the various psychoanalytic 'mirror' theories eg. Winnicott 1967; Lacan 200; Kohut 1991). It recurs in dreams symbols where castration is represented by a multiplication of a genital symbol.

Following Rank, Freud (1919, 235) argues that:

the 'double' was originally an insurance against the destruction of the ego, an 'energetic denial of the power of death,' probably the 'immortal' soul was the first 'double' of the body. Such ideas...have sprung from the soil of unbounded self-love, from the primary narcissism which dominates the mind of the child and of primitive man. But when this stage has been surmounted, the 'double' reverses its aspect. From having been an assurance of immortality, it becomes the uncanny harbinger of death.

Schneider (2009) has studied the psychodynamics of different types of horror doubles: *doppelgangers* (physical doubles, doubles by multiplication) including replicas, twins, chameleons, replicants, robots, cyborgs, clones and apparitions; and *alter-egos* (mental doubles, doubling by division) including schizos, shape-shifters, projections and psychos. Each type of doubling creates specific filmic effects and draws on different but related psychodynamic factors.

The development of psychoanalytic feminist film theory provided fresh horror perspectives. Barbara Creed's (1993) groundbreaking *The Monstrous Feminine* utilized Kristeva's (1982) concept of the 'abject', Christian Metz's (1986) theories of spectatorship and Laura Mulvey's (2009) work on the voyeuristic sadistic male gaze to elucidate the horror of the feminine in the: witch, archaic mother, monstrous womb, vagina dentata, possessed, femme castratrice, castrating mother and the vampire. Creed critiqued Freudian claims that woman terrifies because she is a castrated 'mutilated creature', insisting instead that she horrifies men as *castrator* not *castrated*.

Around the same time, Carol Clover (1993) in *Men, Women and Chain Saws: Gender in the Horror Film*, introduced the concept of horror's 'reactive' masochistic feminine gaze in contrast to the Mulveyian assaultive (sadistic) gaze, as seen in the identification of both genders with horror's 'final girl'. More recently, in *Phallic Panic: Film, Horror and the Primal Uncanny* (2005), Creed turns her attention to the male horror monster in relation to the 'primal uncanny' of patriarchal civilization: woman, animal, death. Male monsters simultaneously express and defend against the anxiety of 'phallic panic', a result of threat against "coherent, stable, and civilised masculinity" produced by destabilizing the binaries of man/woman, man/animal, inside/outside, and life/death (Smelik



Vagina Dentata. Alien (Ridley Scott 1979), *Star Wars VI: Return of the Jedi* (1983, Marquand, Lucas). *Frightened Woman* (Schivazappa 1969)



Abjection: corpse/dead mother (*Psycho*, Hitchcock 1960) and *menstrual blood* (*Carrie*, De Palma, 1976)

2007). These binaries capture many of the core themes Freud identified in the 'uncanny' but are here restated under the theme of gendered identity. The themes discussed here can also be usefully viewed from the perspective of Deleuze|Guattari's (2003) 'becoming-animal' (Dodds 2011a) and the emerging field of ecopsychanalysis in terms of our relationship to the natural world (Dodds 2011b).

Other psychoanalytic approaches to horror include Robin Wood (2003) who uses Freud's theories of the uncanny and return of the repressed, along with Marcuse's (1987) 'surplus repression', to explore the potentially subversive nature of monsters expressing unconscious wishes to smash social norms, a theme partly taken up by Steven Schneider (1999) in his study of monster as metaphor. Twitchell (1988) drawing on Freud's (1998) *Totem and Taboo* and the horror of incest describes horror films as modern versions of ancient adolescent sexual initiation ritual/myths, while the Gabbards (1999) emphasize the compulsion to repeat the traumatic event and point towards the need to master infantile anxiety in horror.

Psychoanalytic contributions to horror scholarship are rich and varied, if at times contradictory, with all schools making significant contributions eg. Lacanian (Žižek, 2007), Kleinian (Young 1992, 1997), and Jungian (Laccino 1994).

IV. Neuropsychanalytic Contributions

As an example of psychoanalytic approaches to horror, Creed and Clover's feminist theses should in principle be able to yield testable hypotheses of gender differences in reaction to the particular horror themes they have identified. For example, if valid it is likely that there will be key differences in the response of experimental subjects to horror depending on the personalities and complex sexual and gender identities which feminist psychoanalytic theory believes are crucial in our experience of horror films. This would require a more sophisticated psychoanalytic assessment system than the traditional tests used in experimental psychology, and would need to utilize psychoanalytically trained raters. However, the complexities involved are within the range of a well-designed study to explore. When traditional experimental techniques are combined with the new tools of neuroimaging, and the recently developed neurocinematics (Hasson *et al* 2008), in the context of a neuropsychanalytically

informed model of the dynamic mind-brain, a new experimental field of neuropsychanalytic aesthetics of (horror) film spectatorship may open up, helping to overcome the two-cultures divide. Neuropsychanalysis can also contribute theoretically with its rapidly developing sophisticated models of the mind-brain.

Each of the various theories above can in principle be investigated experimentally drawing upon the dynamic understanding of the brain offered by neuropsychanalysis, leading us to ask the question: what should we expect to be going on in the brain if this theory is true? At our current level of understanding a full prediction would not be possible, however the participation of certain key neural systems would be expected. For example the Gabbards' (1999) claims would suggest a role for implicit memory (Mancia 2006) and in particular of unconscious emotional memories connected with early preverbal fear conditioning (LeDoux 1998).

In addition, many of the different theories above would suggest the participation of the brain regions involved in particular basic emotion systems identified by Jaak Panksepp (2004). Panksepp and his team have been gradually building up what is probably the most comprehensive understanding of emotions in the mammalian (including human) brain. So far seven brain systems have been found which are evolutionarily conserved in all mammalian brains. These are complex systems which themselves interact in complex often non-linear ways with each other and form a system of energetic field dynamics, dynamic 'attractor' systems which are provide the tools which help us to live our lives (Panksepp 2004). The rich complexity of human emotion is built on top of, around, and within these fundamental emotion systems. The seven 'basic emotion command systems' include SEEKING/Expectancy, PANIC/Separation-Distress, CARE/Nurturance, FEAR/Anxiety, RAGE/Anger, PLAY,/Joy and LUST/Sexuality. A table of these systems and the brain regions and neuromodulators involved is included below (adapted from Panksepp 2007).

| Basic Emotional Systems | Key Brain Areas | Key Neuromodulators |
|--|--|--|
| General Positive Motivation SEEKING/ Expectancy System | Nucleus Accumbens – VTA Mesolimbic and mesocortical outputs Lateral hypothalamus - PAG | DA (+), glutamate (+), opioids (+), neurotensin (+), many other neuropeptides |
| RAGE/Anger | Medial amygdala to Bed Nucleus of Stria Terminalis (BNST). medial and perifornical hypothalamic to PAG | Substance P (+), ACh (+) , glutamate (+) |
| FEAR/Anxiety | Central & lateral amygdala to medial hypothalamus and dorsal PAG Cortico-medial amygdala, | Glutamate (+), DBI, CRF, CCK, alpha-MSH, NPY Steroids (+), vasopressin, |
| LUST/Sexuality | Bed nucleus of stria terminalis (BNST) & Preoptic hypothalamus, VMH, PAG | oxytocin, LH-RH, CCK. |
| CARE/Nurturance | Anterior cingulate, BNST Preoptic Area, VTA, PAG Anterior Cingulate, | Oxytocin (+), prolactin (+) dopamine (+), opioids (+/-) Opioids(-), oxytocin (-) |
| PANIC/Separation | BNST & Preoptic Area Dorsomedial Thalamus, PAG | prolactin (-) CRF (+) glutamate (+) |
| PLAY/Joy | Dorso-medial diencephalon Parafascicular Area, PAG | Opioids (+/-), glutamate (+) ACh (+), TRH? |

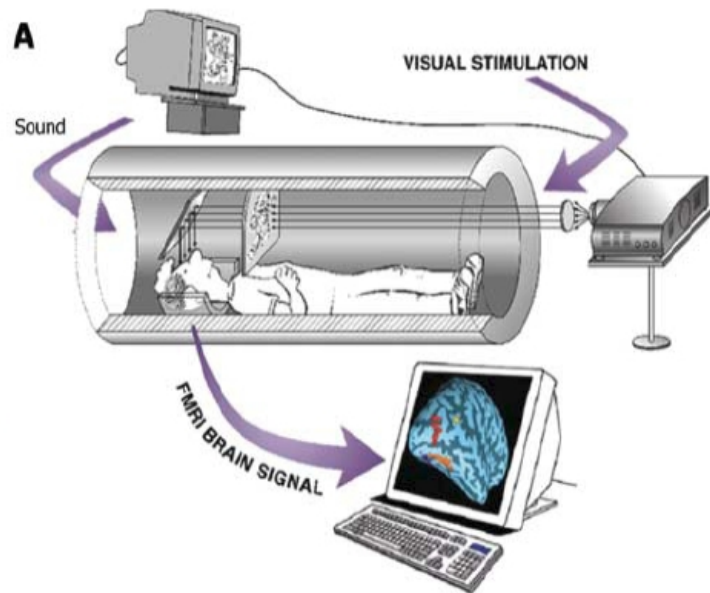
Utilizing these increasingly well-mapped dynamic emotional systems in terms of the psychoanalytic theories of horror above, Robin Wood's theory would suggest crucial participation of the RAGE system (Panksepp 2004) while Kleinian approaches might emphasize the role of paranoid-schizoid and depressive anxiety in horror, which have been linked to two distinct brain systems: the amygdala-based FEAR system involving fight-flight-freezing responses, and the PANIC/Separation-Distress systems, part of the attachment system and closely connected with loss, loneliness and mourning (Panksepp 2004; Schore 2000, 2001). The PANIC system is linked directly to respiratory and vocalization circuits, wiring us to cry when abandoned. PANIC is also connected with pain perception. In fact contact with attachment figures releases opiates reducing pain perception while separation rapidly reduces

opiate supply, instigating withdrawal symptoms and pain, in the absence of any 'physical' cause of pain. This helps show the poverty of our conceptual apparatus which tends to sharply distinguish between 'real' or physical pain and 'emotional' or psychological pain. All pain is 'physical' even when it is generated purely by internal psychological, emotional, or social processes. We are literally 'addicted to love', heartache is more than a metaphor.

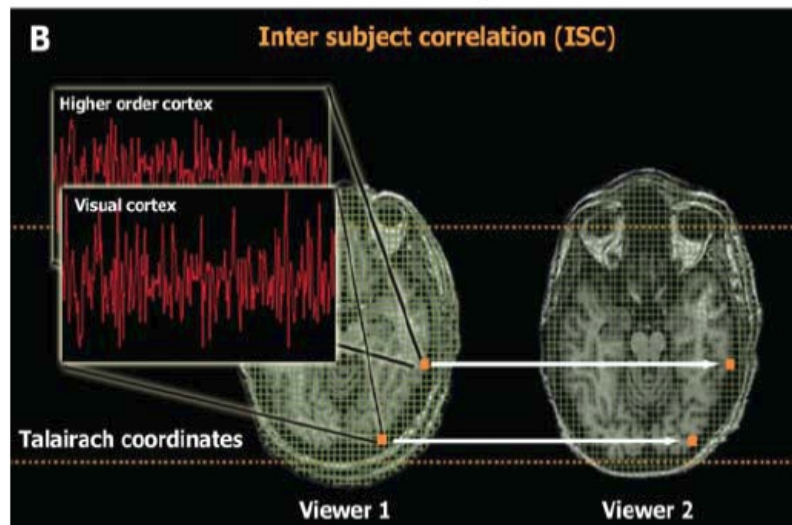
While all of these basic emotion systems converge in the periaqueductal grey (PAG), a region also crucially linked to core consciousness (Panksepp 2004, Solms and Turnbull 2003, Damasio 2000) they are in general neurally and neuropharmacologically distinct. For example the PANIC system includes the anterior cingulate, BNST and preoptic area, the dorsomedial thalamus, and the PAG. It is mediated and modulated through opioids, oxytocin, prolactin, and glutamate. The FEAR system involves the amygdala, medial hypothalamus and dorsal PAG, and involves the neuromodulators: neuropeptide Y, melanocyte stimulating hormone, adrenocorticotrophic hormone, and diazepam binding inhibitor. Other modulators such as CRH seem to promote both types of anxiety reactions (Panksepp 2005). The existence of these two distinct neural systems for generating anxiety itself lends some support to the Kleinian view of the two fundamental types of anxiety, separate from its potential application to film. Further research on this topic may elucidate the relation of these two anxiety systems to Kleinian theory, and the complex contributions of the different anxiety systems in viewers of horror films using techniques derived from neurocinematic (Hasson *et al.* 2008) and psychophysiological (Price 2009) approaches to horror film.

While hypotheses based on what is currently known of these basic systems can in no way even begin to exhaust the theoretical richness of psychoanalytic film theory, they may provide important constraints to theorizing. For example, what would be the consequences should neuroimaging studies show that there is no participation of the RAGE/aggression system in horror film viewing, in any viewers, of any personality type? Most psychoanalysts and even horror fans would be surprised however if this was the case. However should this prove to be true than perspectives emphasizing sadistic pleasure be compromised unless perhaps it could be shown that these RAGE responses were being actively inhibited by a neural based mechanisms for repression (some of which have already been studied, see Mancina 2006, Anderson 2006) or if it could be shown that sadistic pleasure is better accounted for by

predatory behaviour (which is mediated by a separate brain emotion system, the SEEKING system, a tiger on the hunt is much like a foraging animal looking for berries, or humans in their TESCO supermarkets. The tiger doesn't hate his prey, he is licking his lips in anticipation).



Furthermore, explanations of particular horror films in terms of the Kleinian theories of paranoid-schizoid or depressive anxiety should lead to the prediction of differential brain responses in terms of the basic emotion circuitry of the FEAR and PANIC systems. Explanations focussing on perverse sexual desire would expect the key participation of the LUST and SEEKING systems. As well as offering new ways to explore



A. Cartoon illustrating the experimental set-up for Hasson et al.'s Inter Subject Correlation (ISC)-based neurocinematic research. B. ISC. (From Hasson et al. 2008)

psychoanalytic approaches to film, studying our emotional responses to horror may also help to show us something new about human emotions in the context of the living dynamic mind-brain.

Finally neuroscientific and cognitive approaches to film also have much to gain from this engagement with psychoanalysis. Without the richness of psychoanalytic theory to guide research and help suggest where to look, it is doubtful the full complexity of spectatorial response will be found experimentally, especially the more dynamic interacting factors which are of such central interest to psychoanalysis.

V. Neurocinematics and the Cognitive Science of Horror: A Challenge to Psychoanalysis

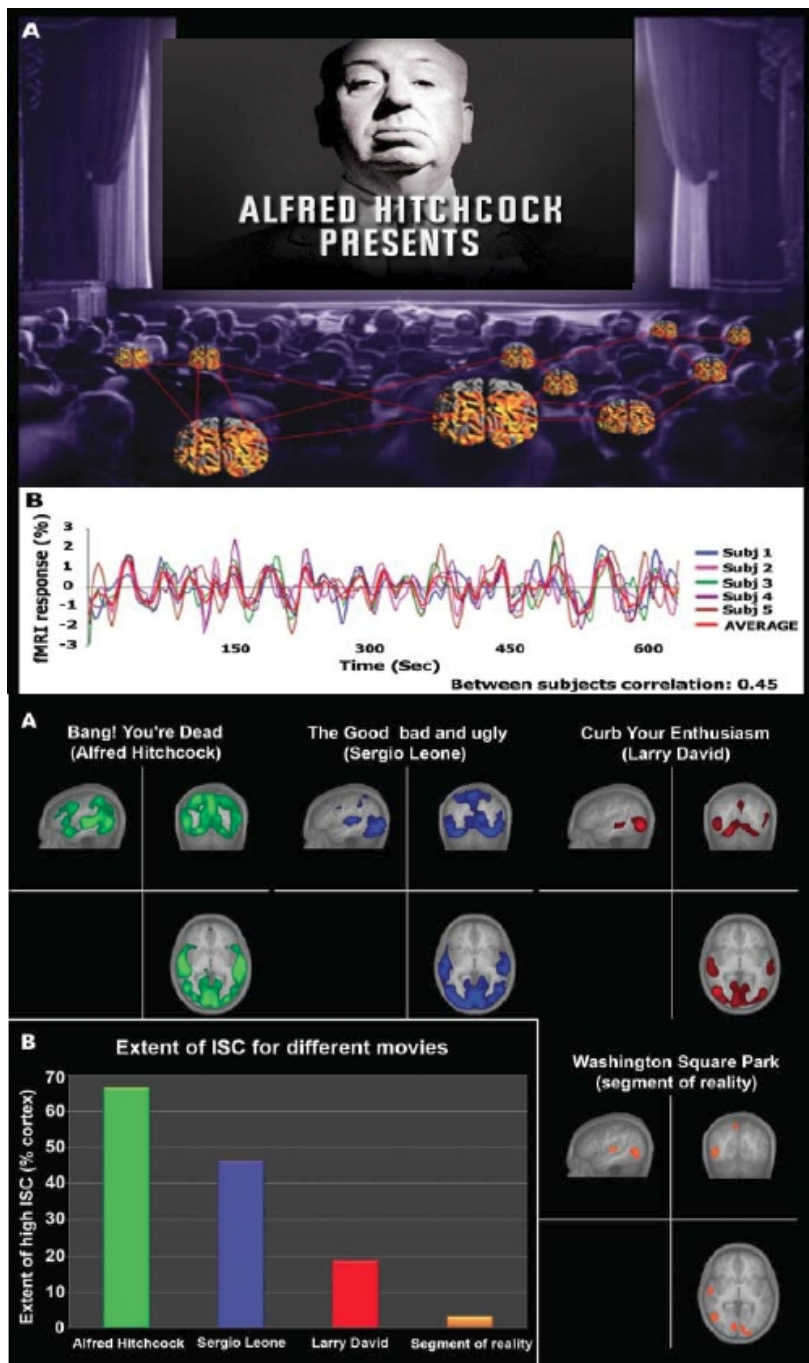
The the artist is in a sense, a neuroscientist, exploring the potentials and capacities of the brain, though with different tools...[Neuroesthetics] will constitute the next giant step in experimental studies of the visual brain. (Zeki 2009)

Recently psychoanalytic film theory in general and psychoanalytic approaches to horror in particular have been challenged in their hegemony by 'cognitive science' approaches to film. Many of the attacks are well worn attacks on psychoanalysis itself including the claim that psychoanalysis is not scientific and not falsifiable. Investigators such as Price (2009) argue that if we need a psychology of film, it is better to use a psychology with more evidence and empirical support than psychoanalysis and therefore seek to replace psychoanalytic approaches by researching the way the human brain and body respond to watching films based on cognitive science theories and methods.

One fascinating recent development is Uri Hasson's 'neurocinematics' (Hasson *et al.* 2008) which claims, drawing on the affective neuroscience of Damasio (2000) and LeDoux (1998) which is also crucial to neuropsychology, that control of brain states is the same as controlling subjects mental states, perceptions, emotions, thoughts, and attitudes (Hasson *et al.* 2008). In their experimental technique, viewers watch different types of films while in an fMRI scanner. This is an important new development in cognitive science approaches to film, as it allows relatively 'free viewing', without the strictly controlled assigned tasks which are usually deemed essential in any fMRI study, allowing the more dynamic nature of film to come into play.

It is able to do this as rather than compare the subjects results on a task with a control condition, the results gained from the fMRI are subjected to an inter-subject correlation analysis (ISC) to assess similarities in spatiotemporal responses across viewers brains. About 45% of the neocortex showed high correlation ($p < 0.001$) between subjects during free viewing. The areas involved included, among others, the visual areas in the temporal and

occipital lobe, auditory areas in Heschl's gyrus and Wernicke's area, multi-sensory areas in parietal and temporal lobes and areas involved in emotion.



ISC for four different films: Alfred Hitchcock Presents: Bang! You're Dead (green), Sergio Leone's The Good, the Bad and the Ugly (blue), Larry David's Curb Your Enthusiasm (red), and an unedited, one-shot segment-of-reality video (orange) (Adapted from Hasson et al. 2008)

Imaging the dynamic mind-brain engaged in film viewing is interesting in itself, however, Hasson et al. (2008) also found substantial variability between the amount of control over brain activity that different films exert. Interestingly, following Hitchcock's well known claims that his work represents a precise science of fear, Hanson et al. (2008) found that compared to *The Good, the Bad and the Ugly* (Leone 1966) and *Curb Your Enthusiasm* (David 2000), *Alfred Hitchcock Presents Bang! You're Dead* (1961) exerted the highest amount of brain control across subjects (18%, 45%, 65% respectively).

They argue these neural effects are a result of differing levels of 'aesthetic control', and the "that Hitchcock was able to orchestrate the responses of so many different brain regions, turning them on and off at the same time across all

viewers, may provide neuroscientific evidence for his notoriously famous ability to master and manipulate viewers' minds." (Hanson et al. 2008).

Semir Zeki (2009) and colleagues are attempting a related project they call 'neuroesthetics', not specifically about film but to start a more general neuroscientific study of art. Zeki (2009) argues that "how such creations can arouse aesthetic experiences can only be fully understood in neural terms...an understanding [which] is now well within our reach." Neuroesthetics calls for an analysis of neural variability in the organization of the visual brain and its connection to various emotional states, and includes drawing on what artists and by extension film makers "who have explored the potentials and capacities of the visual brain with their own methods, have to tell us in their works". Zeki proposes to study the neural basis of aesthetic experience and concludes with three 'neuroesthetic' claims: "that all visual art must obey the laws of the visual brain, whether in conception or in execution or in appreciation; that visual art has an overall function which is an extension of the function of the visual brain, to acquire knowledge; and that that artists are, in a sense, neurologists who study the capacities of the visual brain with techniques that are unique to them", including, we could add, the techniques of horror.

Neuropsychanalysis can make an important contributions here on two main levels. First, by taking the critique of psychoanalysis seriously (Price 2009) it can provide means to validate experimentally key psychoanalytic claims from a methodology outside of psychoanalysis itself, and thus answer the Popperian (1959) charge of unfalsifiability. An increasing amount of neuroscientific data is now available for this purpose (Solms and Turnbull 2003), upon which psychoanalytic approaches to film need ultimately to be based. A psychoanalytic film theory resting on the more firmer empirically validated ground of neuropsychanalysis can provide a stronger base from which the at times overly creative theorizing of psychoanalytic film criticism can take place. Secondly, neuropsychanalysis can utilize new experimental approaches such as neurocinematics to conduct research on specific psychoanalytic theories of film in general, and in this context, the horror film.

VI. Psychophysiology of Horror: The 'Critique of the Missing Spectator'

As well as general critiques of psychoanalysis from cognitive approaches to film there are

more specific challenges which neuropsychanalysis is well placed to meet. Stephen Price (2009) in 'Violence and Psychophysiology in Horror Cinema' applies psychophysiological methods to studying horror and states his 'critique of the missing spectator' in film theory. Despite concepts such as spectatorship, gaze, and 'the body', film theorists tend to do no empirical work studying actual responses to this 'body genre' (Williams 1995) which real spectators experience with their physical bodies.

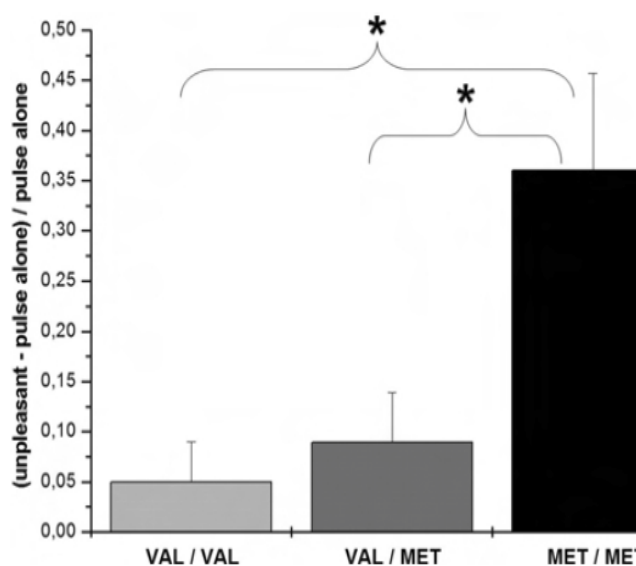
In its place Price offers the techniques and findings of cognitive psychology and studies of biologically based processes of perception, emotion and arousal. For example, in accounting for the rise of slasher films, Price draws on Hebb's fear conditioning and explains fear in spectators as resulting from seeing fear depicted in horror film characters. He then looks at the 'fright inducing' elements and their dramatic increase during horror film evolution. Further, to explore gender issues in horror preference Price draws on cognitive gender socialization theory (Zillmann and Weaver 1996) to explain why horror audiences are mostly young and especially male, a position actually not far removed from Twitchell's (1988) psychoanalytic theory of the horror film as adolescent sexual initiation ritual or to certain feminist theories of the ideological project of horror, especially as Zillmann's (1998) use of 'excitation-transfer theory' suggests important links between sexuality and aggression.

Boys...must prove to their peers, and ultimately to themselves, that they are unperturbed, calm and collected in the face of terror; and girls must similarly demonstrate their sensitivity by being appropriately disturbed, dismayed, and disgusted. Such demonstration seems important enough to adolescents to make them seek out cinematic horror and to subject themselves to emotional torment (Zillmann 1998, 197, quoted in Price 2009).

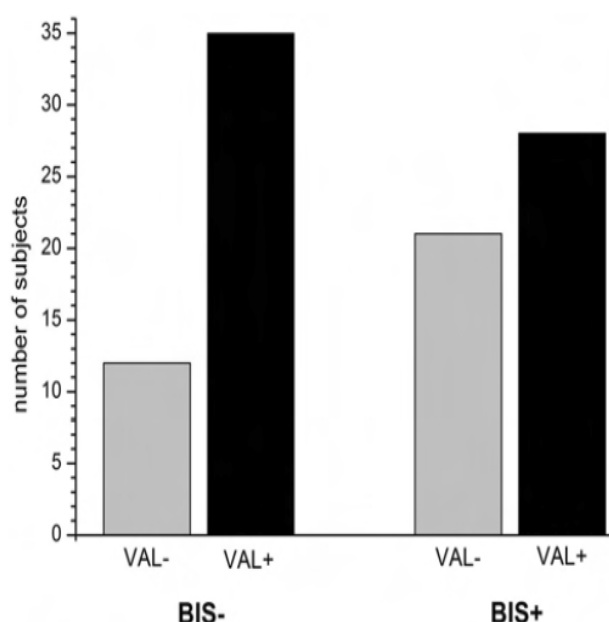
Psychoanalytically inclined film theorists who wonder whether this explanation is really a deep and complete enough an understanding of gender and horror need to engage in experimental research where what they believe are more nuanced explanations can be tested. By refusing to engage with this level of analysis, psychoanalytic approaches leave themselves open to attack. On the other hand, without the more sophisticated theory of psychoanalysis to guide it and to integrate the diverse empirical findings, experimental research will be unlikely to develop much further. Together, experimental research is likely to uncover many new ways to understand horror film spectatorship as well as refuting at least some of the many (often

competing) psychoanalytic theories of the horror film.

Stephen Price further attempts to resolve the paradox of horror using psychophysiological data such as arousal and the subject's cognitive interpretations of their physical responses (alertness, sense of body operating at peak, sexual arousal following anxiety threats, rush of energy) in the context of Zuckerman's sensation seeking (SS) personality trait theory. High SS's try to maintain high arousal levels from both positive and negative sources and Price found they prefer pictures/films with more aggressive/violent content. Such an approach studying the psychophysiology of arousal, may be adapted to explore more complex psychoanalytic understanding of aggression and sadism in connection with more neuroimaging based techniques such as neurocinematics.



COMT Val158Met and the affective startle reflex modulation in the unpleasant condition. The x-axis is divided up into the three different genotypes of the COMT Val158 Met polymorphism. On the y-axis, the magnitude of the startle reflex. In contrast to the Val/Val or Val/Met groups, the Val group (Met/Met) responds with a significantly potentiated startle to the pulse in the unpleasant picture condition. (From Montag et al. 2008)



Distribution of the genotype frequencies of Val (Met/Met, Val/Met and Val/Val) in the dichotomized groups of participants scoring low Behavioural Inhibition (BIS-) and high (BIS+). On the x-axis, different genotypes of COMT Val158Met polymorphism are depicted. Carriers of the homozygous Met/Met genotype (Val) scored on BIS more often high 'than carriers of the Val allele. (From Montag et al. 2008)

In a similar study on horror film enjoyment, physiology and personality traits, Palmer (2008) found that increases in systolic blood pressure (SBP) while watching a 10:33 minute horror film were predicted by the personality traits of Coldheartedness (positively correlated) and Fearlessness (inversely correlated.) This opens up some interesting possibilities for investigating the relation of horror viewing to the complex and rich aspects of personality

psychoanalytic film theorists believe to be crucial in horror film spectatorship.

Finally, in a study widely (but over simplistically) reported as finding a genetic link with horror film enjoyment, Montag *et al.* (2008) show that variations of the COMT gene (linked to control of anxiety) is significantly correlated with subjects startle response and its modulation. People with two copies of COMT158Met had a significantly increased startle response and decreased ability to control fear than those with both Val158 and Met158 versions or two Val158's. They conclude by linking COMT 158Met to potential affective psychopathology and alterations in neural emotional regulation and arousal systems. The theory is that differences between those who love and those who hate horror films may have some genetic basis. However the widely reported media reports of this finding have gone far beyond what the researchers are currently claiming, and further investigation is required to explore this possible genetic contribution.

VII. The 'Paradox of Horror': Dread and Desire in the Limbic Brain

Cosimo Urbano (2009) has critiqued such biological approaches, arguing they they may help explain *how* horror films have their effects (eg. startle response) but not *why* we would choose to put ourselves in the position to be startled, terrified or disgusted. Urbano claims such approaches cannot answer the 'paradox of horror', which is a question of meaning and motivation therefore more suited to psychoanalysis.



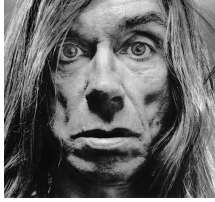
The Birds (Alfred Hitchcock 1963)

In the context of discussing Hitchcock's *The Birds*, Urbano (2009) asks “Why the hell does Melanie go up the stairs at the end of the film? What does she think her searchlight is going to throw light on up there? Is she stupid or what?... No true horror fan would ever ask such a question...S/he would understand that wondering why Melanie climbs the stairs even while

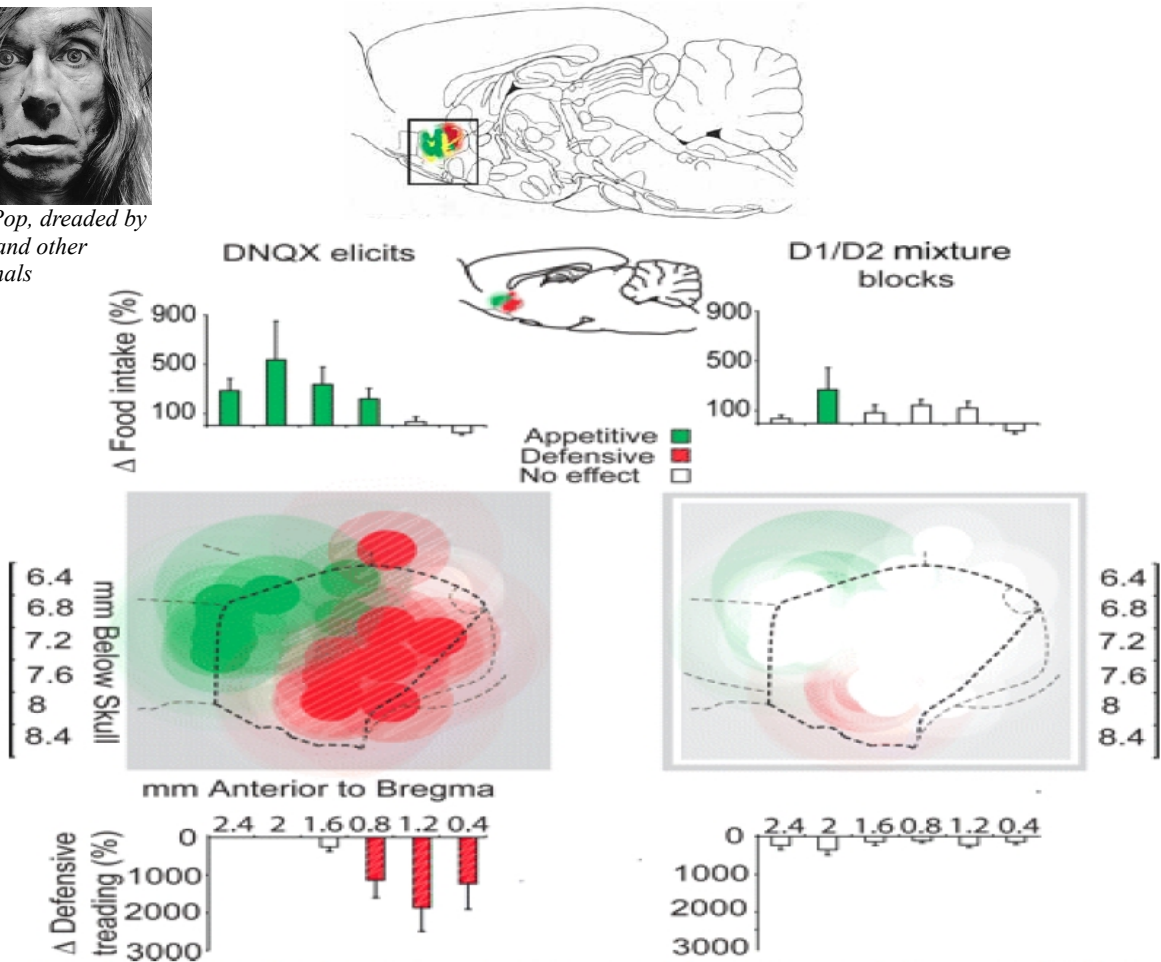
knowing what she is going to find up there, is the same as wondering why people pay to go to see a horror film even while knowing that the film will frighten or otherwise disturb them.” This is precisely where psychoanalysis comes in, describing as it does in rich detail a self in conflict, which can be interpreted to reveal that an “underlying ambivalence drives the subject *toward* rather than *away from* its precipitating causes. Melanie goes upstairs because *she wants to*...unless one is willing to accept that Melanie's reason for going upstairs is *irrational*, one will never be able to fully enjoy *The Birds*.” (Urbano 2009).

Urbano's critique is a powerful one, and yet I argue, like many claims of psychoanalytic film theory, that Urbano's hypothesis is at least in principle potentially testable, using the very psychophysiological and neuroscientific approaches he criticizes. There is clearly the danger of serious reductionism in these purely biological approaches, and a loss of the richness and subtlety of the psychoanalytic tradition. However, it is important to take Price's critique of the missing spectator seriously and respond by initiating an experimental neuropsychanalytic research programme into (horror) film spectatorship, bringing psychoanalytic film theory to the brain itself, and the brain to psychoanalysis. Increasingly sophisticated attempts in neuropsychanalysis and neuropsychosomatics (eg. Stora 2007, Green 2004) are attempting to tease out the complex, developmental relationship between mind, body, self, conflict, emotion, and trauma. Urbano's theory for example suggests the crucial participation of brain regions involved in the mediation of desire, dread and ambivalence.

Berridge *et al.* (2008) have been exploring the role of mesolimbic dopamine in connection with localized glutamate disruptions in the nucleus accumbens (NA), a region equally activated by desirable and fearful stimuli (more rostral areas for desire and more caudal for fear, with a continuum between). rostral areas for desireIn a procedure utilizing the music of Iggy Pop to scare rats, they showed that the same brain circuit flips between desire and dread and is sensitive to small environmental variations. They further demonstrated that the mesolimbic dopamine pathway (the 'libidinal' SEEKING system, Panksepp 2004) plays a crucial role in generating both. “Dopamine has been suggested previously to contribute in a related way to pathological exaggerations of fearful salience, as a motivational component of paranoia in human schizophrenia...as well as for excessive “wanting” for rewards in conditions such as addiction.”



Iggy Pop, dreaded by rates and other mammals



Summary map of "desire versus dread" motivations. Appetitive eating behavior (green symbols) was stimulated by DNQX microinjections in the rostral shell, whereas fearful defensive treading was elicited by caudal DNQX microinjections (red symbols; criteria for including a DNQX site was a >9 min increase in eating duration plus a >200% increase in food intake for appetitive effects, and >20 s duration and >400% increase in defensive treading behavior; both compared with vehicle microinjection at same site). Addition of D1 and D2 receptor antagonists in the mixture condition blocked the ability of DNQX to generate either eating or defensive behavior at most sites (right). (Adapted from Berridge et al. 2008).

Berridge's work is clearly important for a neuropsychanalysis of horror, with its finding of the deep connections between fear and desire long postulated by psychoanalysts. "We experience desire and fear as psychological opposites" write Berridge et al. (2008) but "from the brain's point of view they seem to share a common kernel that can be flexibly used for either one". As well as *overlap* between brain circuits of desire/dread, Berridge has shown a *distinction* between 'wanting' and 'liking' circuits, and between fear and pain: "negative emotions involving fear and pain also are dissociable into core processes...[and] core processes of fear and anxiety may overlap with those of positive desires...positive and negative emotions may share psychological building blocks (such as incentive salience) even though the final emotions are experienced as opposite."

Unconscious emotional processes are key here with core 'liking' and 'wanting' contributing to conscious desire but being in themselves unconscious. Berridge (2004) argues that understanding the neurophysiological basis for 'wanting' "provides insight into cases of truly irrational desire, where one wants what is neither liked nor expected to be liked", which in the 'paradox of horror' involves seeking what on the surface can only cause pain, terror and disgust. Berridge's psychoanalytically intriguing findings,

elegantly showcases how seemingly conflicting psychological components drive our motivations. What seems to be one behavior can actually be divided, and...some things that seem completely opposite may share the same brain structure. This research tantalizingly leads to the question of how we can be aware of the emotions and motivations that combine these psychological components, but not have direct access to the underlying components themselves." (Pollick 2008)

VIII. Neuropsychanalytic Aesthetics of Horror: the Uncanny and the Comic

With the theoretical and methodological foundations so far suggested for a neuropsychanalytic aesthetics of horror, there are many interesting areas of potential research. Affective and social neuroscience and neuropsychanalysis continue to develop a large literature on fear (LeDoux 2002, it is itself interesting that scientists decided first to terrify animals rather than starting with more pleasant emotions) and other key basic emotional systems (Panksepp 2004), crucial for any neuropsychanalytic approach to horror. Mirror neuron research (Gallese 2006), the neuroscience of self-other relations, and the biology of attachment and empathy (Watt 2007, de Vignemont and Singer 2006) are all likely to prove useful in studying different forms of identification with film characters and monsters, to understanding horror as a 'body genre', and the various contributions to horror film pleasure.

Recent theories of "shared neural representations" (Gallese 2006, Uddin *et al.* 2008) and the "activation of shared affective neural networks" enabling us to "feel the emotions of others as if they were our own" (de Vignemont and Singer 2006) are likely to be important in this regard, along with proposals for a social neuropsychanalysis of groups (Dodds 2009).

Neuropsychanalysis has much to contribute to an understanding of horror film spectatorship as well as to understand emotional/aesthetic reactions to film and art more generally.

One intriguing area for possible study is suggested by the fact that Freud's description of the uncanny is 'uncannily' similar to his theory of the comic (Freud, 1990) but he never formally made the connection. In both his analyses of the uncanny and of the comic Freud explores the idea of intellectual uncertainty, repetition and the compulsion to repeat, the inanimate/animate in the figure of the doll and in psychic automatism.

The uncovering of psychical automatism is one of the techniques of the comic, just as is any kind of revelation or self-betrayal...Now, dolls are of course rather closely connected with childhood life. We remember that in their early games children do not distinguish at all sharply between living and inanimate objects, and that they are especially fond of treating their dolls like living people (Freud 1905, 354-345).

Here, as with Freud's understanding of the uncanny fear of being buried alive, we have something from an earlier period which was *not* frightening originally; becoming uncanny only after it had been repressed. Again, Bakhtin's (1984) analysis of carnival and of the 'classical' and 'grotesque' bodies is useful here. As while the theme of the grave/womb is one of the most uncanny tropes of all according to Freud it is also at the heart of Bakhtin's theory of carnival and the grotesque body. In Bakhtin, the grave/womb degrades and renews, destroys and creates, kills and gives birth and is the pivot of the 'double body' and the centre of carnivals ambivalent universe. Further, in addition to the uncanny castration threat associated with the eyes in *The Sandman*, eyes (which are often seen as the key organ of the classical body associated with unitary self-hood, mastery and control) can also have a comic effect. "The eyes have no part in these comic images: they express the individual...self-sufficient human life...The grotesque is interested only in protruding eyes" (Bakhtin 1984).



The uncanny/comic doll: psychical automatism, the double, self-betrayal, intellectual uncertainty and blurring the living/dead boundary in Dead of Night (Cavalcanti, Crichton, Dearden and Hamer 1945)

Returning to Freud's quote above, perhaps the doll, especially the talking doll, is the classic image of both the uncanny and the comic: through the suggestion of automatism, by blurring the distinction between the living and the dead, the intellectual uncertainty involved in its uncertain status, its relation to childhood, and by standing in as a figure of the double. The doll also evokes images of carnival, voodoo, and magic, the latter being an example of the uncanny effect Freud found in ideas or beliefs which we seem to have surmounted but which remain nevertheless in the timelessness of the unconscious.

The doll is also, in Western societies, a typical form of Winnicott's transitional object, placing it in that paradoxical but potentially playful space between me and not me, between the objective object and that which is subjectively perceived, between the thumb and the teddy bear, inside and out, dream and reality. In fact, Winnicott's description of the potential space is interestingly not so far removed from Freud's uncanny. We might compare their relationship to the dark phantasies of the witches' sabbath emerging in the European witch trials which reprised many of the images of suppressed carnival festivities, a violent return of the repressed. Bakhtin and Winnicott's potential space of play can degenerate into the dark carnival of horror. The comic is fundamentally ambivalent (Bakhtin 1984).

Even within the text of *The Uncanny* itself, Freud continually comes unstuck in his analyses as taken to their conclusion each argument ends in something comic, for example in the context of the 'compulsion to repeat' Freud tries to show its association to the uncanny, only to slide once more towards the comic: "Or one may wander about in a dark, strange room, looking for the door of the electric switch, and collide time after time with the same piece of furniture – though it is true that Mark Twain succeeded by wild exaggeration in turning this latter situation into something irresistibly comic" (Freud 1919, 359). Uncannily (or comically), the comic seems to intrude into Freud's essay every time he feels he may have finally succeeded in pinning down his definition of



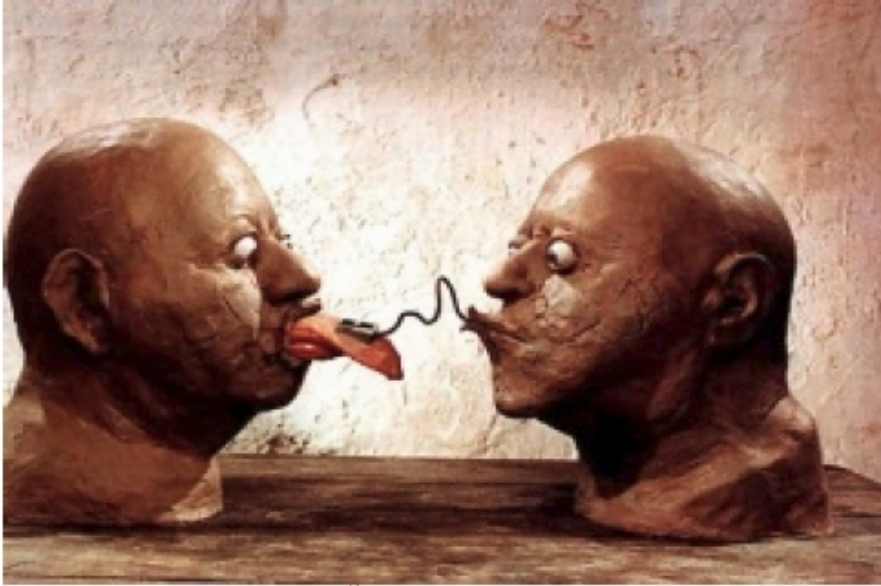
*Horror-Clown Freddy Krueger in
A Nightmare on Elmstreet
(Craven 1984)*

the uncanny. After narrowing his definition down to something familiar in the individual or 'race's' past that had become repressed he realises that not “everything that fulfills this condition...is on that account uncanny” (Freud 1919, 368). He then gives the example of Herodotus' story which contains “no trace of uncanniness...in which the master-thief, whom the princess tries to hold fast by the hand, leaves his brother's severed hand behind her instead” (Freud 1990, 369). This is a trick typical from ambivalent universe of trickster mythology (Hyde 1999).

Freud tries to overcome his difficulty by bringing in the difference between fantasy (fiction) and reality (Freud 1919, 373). Here Freud seems close to relating the uncanny to Winnicott's paradoxical potential space between the inner and external worlds. An “uncanny effect is often and easily produced when the distinction between imagination and reality is effaced” (Freud 1919, 367). When this space is accepted and embraced, as in the comic, in trickster mythology, and in carnival, the uncanny effect disappears. I would use this to differentiate the uncanny from the frightening. In the uncanny, there is still ambivalence and paradox, a connection between the grave and the womb, even if only by a string at breaking point. The 'core' of the uncanny feeling still preserves a link to carnival. The ending of Freud's paper is extraordinary. In trying to finally pin down the uncanny that keeps escaping him he gives a series of means to avoid the uncanny feeling, which all result in the comic.

In Nestroy's farce...the fleeing man...lifts up one trap-door after another and each time sees what he takes to be a ghost of his victim rising out of it... We know what went before...so what must be uncanny to him has an irresistibly comic effect on us. Even a 'real' ghost, as in Oscar Wilde's *Canterville Ghost*, loses all power...as soon as the author begins to amuse himself by being ironical...and allows liberties to be taken with it. (Freud 1919, 375-6)

This last example puts one in mind of the sequence near the end of *A Nightmare on Elm Street* (Craven, 1984), where the 'horror-clown' Freddy Krueger begins to get caught in the traps set by the heroine, the frightening earlier parts of the film give way to comedy. It can therefore be seen that horror and the uncanny can at times very close to the comic (LeDrew 2006, Greenberg 2009), just as comedy can also be deeply connected to tragedy. Greenburg (2009) has explored the different uses of the comic in the horror genre but here I am suggesting more of an intrinsic connection.



Dimensions of Dialogue (Švankmajer, 1982)

This counter-intuitive overlap is perhaps most effectively illustrated in the bizarre films of the Czech surrealist animator, sculptor and film maker Jan Švankmajer. By blurring bringing the inanimate to life, by 'animating' people as though they were puppets, the automatised of eating in the use of extreme close-up animation of peoples mouths,

through the use of part objects, dolls, puppets and bizarre yet everyday, alien yet familiar objects of all kinds, Švankmajer utilizes the full range of techniques related to the Freudian uncanny (related as we have seen to Freud's theory of the comic). The effect of his unique style, whose work hovers between horror and humour, perversion and pleasure, with momentary feelings of guilt in between when we briefly realise the enjoyment we take in the film makers sadism. The movement back and forth takes place with such rapidity and intensity that we are left dizzy and breathless.

IX. The Neuroscience of Laughter and Horror

Laughter and horror share one further connection in Julia Kristeva's (1982) theory of the semiotic, which has become an important component of psychoanalytic theories of horror via what she calls the abject, particularly following the work of Creed (1993). According to Kristeva, both laughter and abjection are eruptions of the semiotic of the body into the symbolic networks of language and meaning, perpetually threatening to disrupt the symbolic dimension. This might bring to mind a whole host of horror films which involve the 'evil' laughter of the witch, the mad scientist, or the psychopath, or Milan Kundera's (1996, 85-87) distinction between the laughter of the angels and the laughter of the devil.

The first time an angel heard the devil's laughter he was dumbfounded...the devil's laughter, which is terribly contagious, spread from one person to another. The angel clearly understood that such laughter was directed against God and...the dignity of his works. He knew that he must react swiftly... Unable to come up with anything of his own, he aped his adversary...[but gave his laughter] the opposite meaning... Thus the angel and the devil faced each other and, mouths wide open, emitted nearly the same sounds... And seeing the angel laugh, the devil laughed all the more...because the laughing angel was infinitely comical. Laughable laughter is disastrous. Even so, the angels have gained from it. They have tricked us with a semantic imposture.

Does neuroscience have anything to say on this issue? Is there a neurological connection between horror, fear, laughter and the comic? If so, neuroscientific work on laughter, mirth, jokes and tickle (excellently reviewed in Holland 2007) may help explore this further from a biological perspective. Panksepp and Burgdorf (2003) have recently shown that rats can be tickled and laugh (emitting a 50-kHz sound) when they do so. This has opened up new possibilities for neuroscientific research into laughter. Laughter depends on the disinhibition of a brain system we share with other mammals. It is thus possible to induce laughter by direct stimulation of the brain to many different regions, from the fusiform gyrus and parahippocampal gyrus (Arroyo. *et al.* 1993), to the lateral border of the supplementary motor area (Fried *et al.* 1998), subcortical regions (Krack *et al.* 2001) and the anterior cingulate cortex (Sem-Jacobsen 1968). Lesion studies in human and animal models have also helped explore the 'laughter circuits' further. For example damage to the frontal cortex, pyramidal tracts, the ventral mesencephalon and the pons can all cause laughter (Black 1982, Holland 2007).

The experimental psychologist Robert Provine's (2000) study of laughter emphasizes the link with communication and social processes in both animals and humans. Other studies on both animal and human models have shown by various researchers have also found that laughter is a primarily social phenomenon (Panksepp 2000, Panksepp and Burgdorf 2003, Meyer *et al.* 2005). Many different types of laughter have been deduced, with natural spontaneous laughter being triggered subcortically and thus arising early in mammalian evolution, while more complex responses to humour and jokes rely on far more advanced regions of the brain. It seems that many different psychoneurological processes can trigger laughter, with the final common 'laughter-coordinating' centre in the brainstem, "in the dorsal area of the upper pontine mesencephalon...connected to the PAG [periaqueductal grey] and the RF [reticular formation]" (Wild *et al.* 2003, 2121-2130, quoted in Holland 2007, 47).

Laughter appears to be a motor programme usually inhibited by GABAergic pallidal neurons in the basal ganglia but can be released when striatal neurons in the basal ganglia are stimulated with dopamine, the leading neurotransmitter associated with Panksepp's (2004) SEEKING/reward/libido system. Thus we laugh in the anticipation or the experience of pleasure. As Freud (1905) argued, laughter is a release of tension, a disinhibition, a saving of energy expenditure. The frontal inhibition mechanisms can be turned off by a variety of processes (lesions, chemicals, diseases, tickle, jokes, social nervousness, and even horror films) which then releases the subcortical motor programme and results in the eruption of laughter. In terms of the comic/horror connection the question would be how horror films may trigger this system, perhaps via the desire/dread nucleus accumbens mechanism discussed by Berridge *et al.* (2008). This still awaits further study. Holland (2007, 41) points out the strange situation that:

In ordinary life, we have one physical response, laughing, but it can be induced by three very different stimuli or circumstances. One, we laugh when tickled. Two, we laugh for purely convivial, social reasons. Three, we laugh at jokes, wit, and less intellectual stimuli-like pratfalls and practical jokes. Leaving direct action on the brain aside, we can hypothesize that the latter three all involve the same psychological situation. Laughter is induced by, first, a mild, sudden, and playful threat to our ongoing process of maintaining and re-creating a personal style of responding to many things besides jokes followed by, second, the nullification of that mild threat.

This argument draws on the evolutionary approach to laughter or Ramachandran (1998), the 'false-alarm' laughter theory. Ramachandran argues that laughter originally evolved as a powerful and rapid social signal to communicate to others in your group that the feared danger (the proverbial potential tiger in the bushes) turns out not in fact to be a reality (merely light playing on a pile of fruit). Neuroscientific understandings of laughter, jokes and mirth at the level of the brain are proceeding apace, and it is certainly too early for any conclusions, but it is interesting that already there is seen to be a role for anxiety, threat, and therefore the FEAR system (Panksepp 2004, Panksepp and Burgdorf 2003), via Ramachandran's (1998) false-alarm theory, for laughter in humans.

At this stage these are merely suggestive hints, but further neuropsychanalytic investigations

utilizing the full power of modern neuroscientific techniques along with the rich theoretical tradition of psychoanalysis have much to offer. Investigating the relation of the frightening to the comic in the context of horror film research may prove a unique and valuable path of investigation for further studies in this area, as well as opening up these ideas derived from psychoanalytic investigation to more empirical testing. The film genre of comedy need to be explored in its own right from the point of view of neuropsychanalytic aesthetics, a process which may well shed further light on not only the comic, laughter, and jokes, but also horror and the uncanny.

X. Neuropsychanalytic Aesthetics of 'Neuro-chic'

Finally, and more reflexively, an understanding of the psychoanalysis of horror may help us understand current public, scientific, and psychoanalytic, fascination with brain imaging and neuroscience. There is something uncanny, repelling and compelling about this particular piece of flesh, a pull which draws us in hypnotically to try and uncover its mysteries. The appeal is partly *aesthetic* and so a neuropsychanalysis of horror may ironically help to shed light on the appeal of neuropsychanalysis itself. To conclude, while acknowledging the connections sketched here have been necessarily highly preliminary, I argue that neuropsychanalysis is well placed to keep much of the richness of psychoanalytic ideas while grounding it empirically with the rigorous tools of neuroscience. Psychoanalytic film theory, filtered through a neuropsychanalytic lens, may provide important new directions for future brain based and theory rich research into neurocinematics (Hasson *et al.* 2008), as well as moving forward the project for a neuropsychanalytic aesthetics (Oppenheim 2005, Holland 2003).

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