‘TERROR & TENSION’

Psychophysiological Suspense: Defining a framework to measure cinematic suspense in 21st century horror films

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ABSTRACT

The construction of suspenseful sequences has been a crucial component for filmmakers to engage the viewer, especially within the thriller and horror genres. This thesis takes a new approach to understanding cinematic suspense by creating a psychophysiological model to measure cinematic suspense and subsequently viewer experience. To date, film scholars and media psychologists have defined the process of suspense in terms of specific story case studies, rather than first independently identifying the components of suspense. Such theories become selective and open to subjective interpretation and have provided misinterpretations of the phenomenon of suspense (Friedrichsen, 1996: 329). Suspense then by existing definitions is not measurable and makes it hard to quantify any discussion of cinematic suspense in relation to viewer experience. Although film scholars and media psychologists recognise that the experience of suspense involves cognition, emotion and physiology, only media psychologists have carried out empirical studies with viewers. Even taking this into consideration there have only been a few psychophysiological studies about the experience of suspense (Kreibig, 2010: 408). Furthermore there is a methodological dilemma, with film scholars preferring a qualitative approach, often via film textual analysis, and media psychologists primarily taking a quantitative approach, analysing data sets using statistical models, which film scholars see as offering little contribution to the complexities of film analysis (Smith, M. 2013). The differences between these methodological approaches raise the question of whether we can gain a greater insight into viewers' experiences of suspense by drawing elements from both research methods and identifying the most appropriate methods, procedures and techniques to defining cinematic suspense. One strategy for achieving this is to turn to the field of Human Computer Interaction (HCI) which often uses mixed methods approaches to resolve such interdisciplinary differences, especially in gaining a deeper insight into user/viewer experience of narrative trajectories (Benford et al. 2009).

This thesis takes an inter-disciplinary approach that combines film studies, media psychology, HCI and psychophysiology. By drawing from film studies and media psychology it will identify the components of cinematic suspense and create a framework to measure suspense. Taking an HCI experiment approach in designing and analysing the findings of the 'Terror & Tension' film experiment, 20 viewers watched 32 short film clips from 8 horror films, dispersed through 4 sub-genres and 4 suspense narrative structures, defined by film scholar Susan Smith: vicarious, direct, shared and composite (Smith, S. 2000). Triangulation was used as a mixed methods approach to capture and analyse three data sets which include: firstly, viewer physiological responses, which were measured in terms of anxiety durability and intensity level by recording viewers' skin conductance responses (SCRs), a component of electrodermal activity (EDA). The findings were then tested to verify the physiological framework to measure viewer experience of suspense. This led to the development of an EDA model of suspense. Viewer feedback was captured through verbal self-reports, which were recorded after watching each film clip. These physiological responses and feedback were then analysed alongside textual analysis of the film clips in a series of case studies to provide a deeper insight into how cinematic suspense is constructed through narrative elements, cinematography, sound and mise-en-scène. The research findings demonstrate that the EDA model of suspense makes a valuable contribution to film analysis and understanding viewer experience of suspense and offers psychophysiology a new framework to measure suspense in terms of anxiety durability and intensity.

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INTRODUCTION

> ‘In the usual form of suspense it is indispensable that the public be made perfectly aware of all the facts involved. Otherwise there is no suspense’ (Alfred Hitchcock cited in Truffaut, 1985: 72).

The above quote by British film director Alfred Hitchcock was made during a series of interviews with François Truffaut in August 1962. The quote underpins Hitchcock’s definition of cinematic suspense, in which the viewer is privileged with information about the protagonist’s situation that they themselves are denied. Hitchcock’s popular example of his definition of cinematic suspense is as follows: The viewer watches a fictional character placing a bomb under a table in a room. Later two other characters enter the scene and sit at the table who are oblivious to the bomb hidden being under the table. While the two characters have a conversation the viewer is also aware that the bomb will explode at a specific time and watch the minute hand of a clock on a wall nearby, moving closer towards the time when the bomb will explode. Hitchcock explains that this story event creates suspense because the viewer knows that the bomb under the table will explode at a specific time and they feel powerless to warn the characters at the table that a bomb will explode and kill them (Alfred Hitchcock cited in Truffaut, 1985: 73).

Hitchcock’s definition of suspense is based on an assumption that suspense is created by the viewer’s fear concerning the safety of the two fictional characters sitting at the table. However, Hitchcock’s definition of suspense does not take into consideration that suspense can be created in other ways, such as when story information is revealed (Hutchings, 2004), concealed or delayed from the viewer (Bordwell, 1985) or when a threat from the story world is directed at the viewer (Hutchings, 2004; Smith, S. 2000; Smith, G. 2007). Even though there is a great body of scholarly research about cinematic suspense there is, within that, no measurable definition of cinematic suspense that can be used to determine a viewer’s experience of suspense. This raises the following questions: What is the components of the phenomenon of suspense? How do narrative elements and the formal film making components construct suspense? How can we measure the construction of suspense and the viewer experience it? According to Mike Friedrichsen, in order to answer these question it is

essential to identify the generic components of suspense so that researchers know that what they are measuring is indeed suspense (Friedrichsen, 1996: 329-330 and 338).

To address this gap in scholarly knowledge in both film studies and media psychology, this thesis will identify the generic components that underpin the process of suspense and provide a framework to measure the viewer experience. This is based on the 'Terror & Tension' film experiment, in which 20 viewers watched 32 short horror films clips extracted from 8 horror feature films. To bridge the limitations of research methods taken by film studies and media psychology, an inter-disciplinary mixed methods approach was taken. This involved drawing on the mixed methods, procedures and techniques in a process called triangulation, commonly used within the field of Human-Computer Interaction (HCI), where quantitative data and qualitative data sets are merged together to discover new knowledge claims about user/viewer experience (Benford et al. 2009). To measure viewer responses to the film clips in the experiment, psychophysiological recording was used to capture viewer physiological responses and their verbal feedback about each film clip was recorded after they watched the clip. These psychophysiological responses and feedback comments were then mapped onto the textual elements of the film clips. A qualitative approach was taken to analyse the data sets to gain an in-depth understanding of viewer experience of suspense in each film clip.

To gain an insight into 'suspense' the discussion will first explore the historical context of suspense narrative which began with the term 'suspense' being used to describe specific real life news stories in newspapers and promotion reviews of theatrical plays and circus acts. Suspense narrative strategies were then used in the serial novel and later transferred to the serial film and promotional techniques across genres. The wider cultural phenomenon of suspense assisted in the development of a specific 'suspense' film genre, the US domestic thriller and Hitchcock's suspense thriller

Cultural and Historical Background to Suspense

By exploring the historical cultural elements that shaped the narrative form of suspense we can gain a deeper insight into the historical association between suspense and fear. The archives of British newspapers and US film and entertainment trade journals reveal some interesting statistics and trends during the 19th-20th centuries. In The British Newspaper Archive, the word 'suspense' appears in newspaper headlines and reports 716,317 times during 1800-1899 (British Library, n.d.).. The breakdown of these figures reveal how 'suspense' became a popular stylist device to dramatise news reports and capture readers' attention. During the first half of the century (1800-1849) there were 154,432 instances of the word 'suspense' in newspaper reports. In the second half of the century (1850-1899) this had risen to 561,885 instances. (British Library, n.d.). In order to explore the context in which suspense was used, I reviewed a sample of The British Newspaper Archive. During 1800-1899 and found that the word suspense was used to promote and review theatrical plays and dramatise news stories concerning human disasters, financial market trends and political policy.

For example, a review of a theatrical play illustrates that suspense was seen as an important narrative process and key to the enjoyment of watching a play at the turn of the 19th century: 'Pure as a well told Tale [sic], which fixes the attention, arouses the passions and holds the faculties in anxious and impatient suspense' (The Salisbury & Winchester Journal, 7th March 1803: 4). However, the term was also used beyond discussions of entertainment. In a newspaper report of a ship's disappearance the word 'suspense' is used to describe a family's anxiety about awaiting news of survivors: '[the] ship has not been heard of since June last. The family is consequence involved in the greatest suspense and anxiety' (Hampshire Chronicle, 18th December 1809: 4). The word 'suspense' was also used to describe anxiety concerning the increase in hop duty in the business financial markets: 'Hop Duty ...the present high prices causing still a state of suspense and uncertainty'(The Era, London, 18th October 1840: 11).

Turning to 1850-1899 the narrative form of poetry was used as an example of 'suspense' being associated with intensely capturing the reader's attention with the

headline in capitals *POETRY HOME* 'O'er many a scene of beauty rare, I roamed in other days; Through gloomy glens, o'er mountains bare: '...home. The ever restless sea. Pleasure seductive intense, The chase, the bowl, the bower; The thrilling hope, the dread suspense. Play's fascinating power...' (Yorkshire Gazette, 18th September 1852: 2). The word suspense is in the headline indicating that suspense is associated with the emotion hope and fear. *THE SUSPENSE* - 'Hope and fear have had a long contest in the balance, since the first formal demand was made upon this country by the United States for compensation for ...' (Daily Gazette for Middlesbrough, 3rd June 1872: 2). In politics the word 'suspense' was used to dramatise forthcoming political decisions: 'Mr. Gladstone and the Czar are still keeping the world in a state of dark uncertainty and anxious suspense' (Essex Standard, 23rd May 1885: 4).

The increase of the word 'suspense' in the press during 1850-1899 was a continuation of how news stories were reported to capture the reader's attention. Although suspense was used in theatrical plays at the turn of the 19th century 'suspense' found its way more prominently into the serial novel as the 'cliffhanger'. This narrative device was first used in the novel, *A Pair of Blue Eyes* published in Tinsley's magazine in 1873 (Nussbaum, 2012). The cliffhanger places the protagonist in a precarious life threatening situation, a dilemma or a story event reveals a surprise to the reader to entice them to read the next chapter or series. (Lambert, 2008: 8). Emily Nussbaum writes 'Primal and unashamedly manipulative, cliffhangers are the signature gambit of serial storytelling' (Nussbaum, 2012: 1), something she explicitly connects with suspense in relation to serial television.

By the early 20th century 'suspense' was linked to various cultural forms of entertainment as illustrated by the trade journal *Billboard* in an article titled 'Drawing in the Crowds'. This article refers to how suspense was used to attract the public to the circus and encourage them to remain in their seats until the show was finished.

> With the crowd in the park, the big sensational and death-defying stunt as the advertising matter proclaims it is held off until near the end of the program. To keep the multitude in suspense, and incidentally to keep them from leaving, is the reason for that move (Fagan, P. 19th March 1910: 86)

This indicates that the circus organisers understood that suspense was an ideal process to draw audiences to circus acts by invoking drama and high tension, such as a tight rope walker who faced personal physical risk of serious injury or death. Also at this time, a new form of narrative suspense emerged - cinematic suspense. Early in the evolution of narrative cinema, film production was limited to short film reels. To make the serial film commercially viable, film production companies had to find a process to entice the audience back into the cinema to see the remaining episodes which were shown on the same day, weekly or both. Film production companies recognised the potential of the cliffhanger which was already an established narrative device associated with suspense in the serial novel. By transferring this narrative device to film it enabled film production companies to hook audiences back into the cinema to watch further episodes of the serial film. This strategy was illustrated in an advertisement from the trade journal *Variety*, promoting the film *The Yellow Menace*, (Aubrey Kennedy, 1916): 'sixteen tremendous episodes, the conclusion of each of which leaves your audience in breathless suspense wondering...What's next?'(Variety, 9th June 1916: 17). The commercial success of incorporating suspense in film is illustrated in the following advertisement in *Variety* for *Come Through* (Jack Conway, 1917): 'it's without doubt one of the greatest suspense dramas ever filmed and will draw the big money!'(Variety, July 6th 1917: 48). Generating suspense then emerged as being very popular with film production companies because it served two purposes, firstly, as a narrative device and secondly a commercial driver enticing audiences to return to the cinema.

Whilst film scholars in the later 20th century position suspense as a clearly defined genre (see Derry, 2001), cinematic suspense was originally portrayed as a cross-genre narrative device to create audience affect. For example, the film *Red Ace*, (Jacques Jaccard, 1917) is a war time spy thriller, with the twelfth episode 'Overboard' in two parts. *Moving Pictures World* wrote: 'This continues the efforts of Virginia and Winthrop to overtake the fleeing spies...This situation creates much suspense and winds up with a hand-to-hand struggle' (*Moving Picture World*, January 5th 1918: 99). The film *Revenge*, (Tod Browning, 1918), a romance and adventure story, is described

as follows: ‘Tragedy enters and death stalks near. The climax of this absorbing picture drama is breath-taking in its suspense and surprise, giving Miss Storey opportunity for the heights of emotional acting, in which she excels’ (Moving Picture World, 2nd February 1918: 694). In these examples, the term ‘suspense’ features across a range of different genres as well as demonstrating how cinematic suspense was well established by the early 1920’s. It was so established, that in a review of the film *Fool Paradise*, (Cecil B. DeMille, 1921) *Variety* claimed that, ‘the suspense in the story is carried to the last notch in the celluloid’ (Fred, 16th December 1921: 35).

According to David Bordwell it was the 1940’s when the cinematic suspense story became an integral part of the popular American domestic thriller. Bordwell explains that the domestic thriller changed the plot of the detective murder mystery story in which where the viewer is presented with a murder and must then resolve the murder using specific clues that are revealed to them during the film. The domestic thriller was different in that the viewer was in a state of suspense as to what happens next in the plot and because of their concerns for the safety of the protagonist (Bordwell, 2013). For Bordwell, the suspense story gained wider popularity in the 1940’s through three major channels of audience consumption: the novel, radio and cinema. The expansion of the suspense story was due to the popularity of detective and spy stories, mystery and suspense, which accounted for 40% of published novels by the 1940’s (Bordwell, 2013).

According to Bordwell, it was the British film director Alfred Hitchcock who was instrumental in driving the popularity of the suspense story on screen with his early 1940s films *Rebecca* (1940), *Foreign Correspondent* (1940), *Suspicion*, (1941), *Saboteur* (1942) and *Shadow of a Doubt* (1943). Bordwell goes on to say that Hitchcock gave birth to the cultural explosion of the suspense thriller: ‘It’s very likely, then, that Hitchcock’s films of 1940–1943 gave an impetus to the emergence of full-blown suspense pictures in the years that followed’ (Bordwell, March 2013: 1). Many film scholars agree that Hitchcock was the pioneer of the suspense thriller (Derry, 2001; Rubin, 1999), however the above exploration of film reviews from the early

1900s demonstrate that cinematic suspense was well established in storytelling in the 1900's before Hitchcock had even started his film career. It is instead clearer to position Hitchock's films as focusing 'suspense' around a particular genre of film, the thriller, and a focus that continues today.

According to Frank Krutnik it was a wider cultural perspective in the 1940s that acted as a catalyst for the expansion of a broader cultural and commercial success of suspense, promoting thrill, tension and excitement. For Krutnik, suspense was not only associated with narrative, but within a wider cultural form of US entertainment, which included circuses, fairground amusements and electromechanical devices, such as pinball machines (Krutnik, 2013). For example Frank Krutnik explains that suspense was essential to playing electromechanical games is demonstrated by the William Manufacturing Company, who designed and manufactured a pinball machine called *Suspense*, which launched in 1946 (Krutnik, 2013: 22). Krutnik goes on to say that the catalyst to the popularity of suspense within a specific genre of entertainment was driven by the radio station CBS, who launched their successful radio programme suspense in 1942, transmitting suspense thrillers during 1942-1962, some involving leading Hollywood actors, and featured film director Alfred Hitchcock in the later CBS television series *Suspense* (Columbia Broadcasting System, 1949-1954) (Krutnik, 2013). For Krutnik, suspense in the 1940s was a ubiquitous form of entertainment, with Hitchcock and the CBS series acting as part of a much wider cultural commercialisation of US entertainment. While the entertainment and commercial value of 'suspense' is apparent from the early 1900s, the 1940s created a closer connection between the term and specific feelings of thrill, tension and excitement.

From a historical context then, 'suspense' was initially used as a way of capturing the reader's attention by dramatizing real life news stories to elicit a deeper emotional connection between the readers and story. The newspapers also used suspense as way of promoting and enticing the public to watch suspenseful forms of entertainment, such as a suspenseful theatrical play or a circus act with life threatening stunts.

Through these cultural forms of suspense emerged the cliffhanger, a form of suspense that had significant commercial benefits in attracting readers to read the serial novel or viewers to watch the serial film. At the same time the cliffhanger gripped the reader or viewer in a state of tension to what happens next. Suspense then emerged as an important narrative device for novels, films and later the 'suspense' CBS radio and TV series. Hitchcock benefitted greatly from the cultural commercialisation of suspense from the 1940's to enable him to create his own specific 'suspense' genre. The discussion will know turn towards how film scholars and media psychologists have defined suspense and the problems associated with not having a measurable definition of cinematic suspense.

The Problems of Defining Cinematic Suspense

Throughout the emergence of 'suspense' as a valuable narrative device within cinema, the precise definition of the term and the experience or emotions is connotes has remained elusive. The study of cinematic suspense leads to the following key questions: What are the components of cinematic suspense? How do the formal qualities of cinematic storytelling work to generate suspenseful experiences for audiences? Is suspense quantifiable? This thesis will explore the answers to these questions by taking an interdisciplinary approach that combines theoretical approaches of suspense from film studies and media psychology using a mixed methods approach inspired by techniques of the field of Human Computer Interaction (HCI). Such an approach is necessary because despite the level of attention separately given to 'suspense' in film studies and media psychology, both approaches contain weaknesses that have prevented a full interrogation of how viewers experience cinematic suspense and how it emerges from the key formal qualities of cinematic storytelling. The discussion will now turn to explore the overarching approaches towards suspense made by film studies and media psychology in order to highlight these weaknesses.

In order to usefully study suspense, a clear working definition is necessary. Different scholars approach the definition differently. Here we look at the opposing

understandings presented by film scholars and media psychologists. Expanding on the complexities of film studies, Janet Staiger argues that film scholars, critics and cognitive scientists broadly use psychology to underpin their arguments through theories of behaviourism, psychoanalysis, cognitive psychology or take a sociological perspective via functionalist and conflict theories (Staiger, 2005). Although Staiger explains that contemporary film scholars who favour philosophy, cultural studies, critical theory, film aesthetic and a metaphysics perspective may seek empirical justification through psychological or sociological methodologies, many film scholars have taken an intellectual elitist position, avoiding justification of their claims, criticism or empirical evaluation (Bordwell, 1996; Carroll, 1996a).

Film scholars gain an understanding of the cinematic text through a production encoding process (Barsam, 2007), with textual analysis being the framework for analysing a cinematic text. Film theories, such as cultural studies and psychoanalytic film theory tend to draw conclusions from broad social and cultural themes, such as attitudes to power, gender, race, social class and sexuality (Staiger, 2005; Barsam, 2007). This means that film scholars' research interests are unlikely to develop a framework for measuring viewer experience because their film theories are not interested in determining the psychological and physiological components of suspense or do not wish to understand the viewer experience. We shall now turn to the methodological approach that film scholars take in understanding film and cinematic suspense.

Film scholars are more likely to take a qualitative methodological approach to analysing the textual elements of the cinematic text which are based on a social construction of knowledge (social constructivism) involving assumptions through subjective meaning of experiences about specific objects or situations (Creswell, 2003) regarding the viewer and the cinematic text (Staiger, 2005; Smith, M. 2013). According to Janet Staiger film studies cannot avoid some form of textual analysis even though scholars may use different methods including 'movie reviews [and] the objects spectators are looking at and listening to' (Staiger, 2005: 13). Meaning is made

from the cinematic text by interpreting such evidence (Staiger, 2005) with the researcher's cultural and historical background shaping their interpretation of meanings made by others, which can lead to developing a theory or pattern of meaning (Creswell, 2003).

One of the main criticisms levelled at some film scholars' methodological approach is that they develop theories based on assumptions about the meaning of the cinematic text and rarely use qualitative techniques that involve stakeholders, such as the 'viewer' who can make a valuable contribution to the meaning-making process through questionnaires, survey, focus groups, ethnographic studies or interviews (Staiger, 2005). For example film scholar Charles Derry used textual analysis and film reviews to create a definition of the suspense thriller which are based on his enjoyment and experience of watching suspense films (Derry, 2001). Charles Derry's methodological approach illustrates why some film scholarly approaches to analysing film have been criticised - because they avoid justification of their claims and empirical evaluation (Bordwell, 1996; Carroll, 1996a). We shall now turn to the research methods used by media psychologists in defining cinematic suspense.

Media psychologists take a scientific approach to define cinematic suspense by gaining insight into the viewer's experience of suspense through an experiment. This involves procedures and techniques to understand how suspense creates specific behavioural/psychological states through changes in cognition, emotion and physiology. This has led to insights concerning the process of suspense, such as the connection between suspense and the emotion interest (Tan, 1998), prior knowledge of a threat (Hoffner & Cantor, 1990), viewer empathetic stress (Zillmann, de Wied & Ordman, 1994), suspense narrative event structure (Brewer & Lichtenstein, 1982), duration of a threatening event (de Wied, 1994; Nomikos et al. 1968), uncertainty of outcomes between protagonist and antagonist (Comisky & Bryant, 1982) and the resolution of suspense (Zillmann, 1996; Madrigal, Bee & Chen, et al. 2011). Traditionally the research method used by media psychologists is quantitative, in both experiment design and in analysing their research findings using statistical models.

According to Dolf Zillmann and Minet de Wied experiment design involves the following criteria:

> (a) a clearly stated research hypothesis about predicted causal effects of independent variable on the dependant variable, (b) the independent variable includes at least two levels, (c) respondents are randomly assigned to conditions, (d) specific and systematic procedures are employed to test the hypothesises, and (e) specific controls are employed to reduce threats to internal validity (Zillmann & de Wied, 1996: 269).

A film clip, scene or feature film is classified as the independent variable, which has been manipulated to elicit a predicted cause-and-effect response in the respondent (dependant variable). The manipulated content (independent variable) is randomised so that the respondents (viewer) do not view the stimulus in the same order. Controls are required to ensure the hypothesis is tested correctly and extraneous variables are controlled so that they do not influence the independent variable. If an extraneous variable changes at the same time as the independent variable the experiment fails to investigate the hypothesis (Friedrichsen, 1996: 332). This means that extraneous variables provide an alternative reason for a specific outcome of the experiment and therefore reduces the experiment's internal validity (Goodwin, J & Goodwin, K. 2014: 145-146). Mike Friedrichsen explains that the problems regarding internal validity are highlighted when making a comparison between two different films because they have so many different textual components such as, story elements, characters, actors and cinematic techniques (Friedrichsen, 1996: 332).

The overarching methodological approach by media psychologists is positivist in that it seeks to test a theory and investigate causes that determine effects or influence specific outcomes. The studies include participants and some form of experiment design to test the theory, for example, measuring children responses of a known threatening stimulus they are about to watch (Hoffner & Cantor, 1990). According to John Creswell the positivist approach is often referred to as reductionist, in that experiments are limited to testing a small set of ideas through hypotheses and research questions that involve measuring specific variables (Creswell, 2003). This means that knowledge is created through a strict criteria of numerical data measurement that is

tested for a high level of certainty (validity) using statistical models (Goodwin, J & Goodwin, K. 2014; Creswell, 2003). With objectivity being essential to the process, the competency of the study involves examining the methods and conclusions for bias which is why validity and reliability of claims are crucial (Creswell, 2003). According to film scholar Murray Smith the reason why film scholars disregard a scientific approach to film analysis is that the quantitative numerical data sets pose limitations for interpreting the complex meaning of the cinematic text, in particular the variety of formal components of filmmaking such as narrative, cinematography, sound, editing, mise-en-scène. Murray Smith goes on to say that film scholars' qualitative methodological approach of textual analysis is suited to the film scholars' requirements of interpreting the complexity of meaning-making of the cinematic text (Smith, M. 2013). Although these two methodological approaches appear to be diametrically opposed the thesis aim is to synthesise these two methods, creating a holistic approach.

According to Mike Friedrichsen both film scholars and media psychologists have created their definitions of suspense based on the conditions within the story world rather than first defining the components of suspense (Friedrichsen, 1996: 329-330 and 338). For example film scholar Charles Derry provides an example in his book *The Suspense Thriller, Films in the Shadow of Alfred Hitchcock* (Derry, 2001), where he defines cinematic suspense based on a collection of films he classifies as 'suspense thrillers' that relate to his own personal viewing experience . He explains:

> The bias in my book towards films made in the last thirty years is precisely the bias of my own experience, that is: those films that have fascinated me in movie theatres and on television, films made contemporary to my own experience (Derry, 2001: 56).

Charles Derry provides an example of how film scholars often take a methodological approach that is based on assumptions rather than seeking evidence to support their theories through the viewer's experience. Turning to an example of how media psychologists have limited the viewer experience of suspense to feeling the emotion fear that pertains to the survival of the protagonist is illustrated in Zolf Zillmann's definition of cinematic suspense:

> …a noxious affective reaction that characteristically derives from the respondents' acute, fearful apprehension about the deplorable events that threaten liked protagonists, this apprehension being mediated by high but not complete subjective certainty about the occurrence of the anticipated deplorable events (Zillmann, 1996: 208).

Although Zillmann's definition of cinematic suspense mentions the cognitive states of anticipation, uncertainty and the emotion fear, mediated through story events that impact the protagonist' survival, the definition of suspense does not include story situations where suspense is directed at the viewer (Smith, S. 2000; Hutchings, 2004) or in a romantic suspenseful scene where a lover waits to here whether their marriage proposal has been accepted (Alfred Hitchcock cited in Truffaut, 1985). Furthermore, Zillmann's definition of suspense does not provide a quantifiable component of the viewer's experience of suspense which would lead to framework to measure suspense. Without such a framework measuring suspense becomes problematic because the experimenter can never be sure what they are measuring when they are attempting to measure suspense (Friedrichsen, 1996: 329-330 and 338).

Methodological Challenges in Defining Cinematic Suspense

When we consider that film scholars and media psychologists have not provided a reliable synthesised framework to measure cinematic suspense we might consider that taking a mixed methods (pragmatism) approach offers an alternative, and fruitful method for interrogating and defining cinematic suspense. This raises the following question that is central to the thesis. What type of mixed methods approach, techniques and procedures would resolve the problem of defining cinematic suspense? We can answer this question by creating a reliable synthesised framework to measure cinematic suspense. This allows the researcher to freely select the most appropriate methods to understand the research problem through multiple approaches, such as triangulation, which uses three lines of enquiry and data analysis (Creswell, 2003; Smith, M. 2013). This means that the selection of methods, procedures and techniques focus on resolving a specific research problem. This involves new ways of investigating, collecting and analysing data rather than working within the designated frameworks of quantitative and qualitative methods.

According to John Creswell, pragmatism enables the researcher to create an experimental approach to researching a problem. As he explains 'Thus, for the mixed methods researcher, pragmatism opens the door to multiple methods, different worldviews, and different assumptions, as well as to different forms of data collection and analysis in the mixed methods study' (Creswell, 2003: 12). Murray Smith encourages a mixed methods approach to gain a deeper understanding of film analysis and viewers' experience (Smith, M. 2013). His mixed methods approach investigates the aesthetic experience through three lines of enquiry: phenomenology, psychology and neuroscience (Smith, M. 2013: 81). Smith's investigation brings three types of data together in an attempt to broaden scholarly understandings of film and illuminate a new direction for film analysis in the 21st century. Although the mixed methods technique of triangulation is new to film studies, it has been practiced by other academic disciplines since the 1980's (Creswell, 2003), in particular the field of Human Computer Interaction (HCI) (Benford, Giannachi, Koleva et al. 2009).

Although this thesis's in-depth study of suspense draws upon methods from film studies, psychology and psychophysiology, it uses a mixed methods approach inspired by techniques used in HCI which can reconcile these seemingly opposing definitions. HCI has a long tradition of applying psychophysiological approaches to experience evaluation. For example in an HCI study *From Interaction to Trajectories: Designing Coherent Journeys Through User Experiences* (Benford et. al., 2009), the researchers created a conceptual framework to measure user/viewer narrative trajectories concerning different entertainment experiences, such as playing video games, museum visits and theme park rides. The paper identified appropriate research methods, procedures and techniques that provide greater insight into understanding complex interactions between a variety of cultural entertainment interfaces and user/viewer narrative trajectories. This framework offers a guide for researchers in and outside of HCI who seek to understand user/viewer experience through new forms of experiment design to capture and interpret complex data sets.

One study that explored trajectory narratives of theme park rides, *Personalizing the theme park: Psychometric profiling and physiological monitoring* (Rennick-Egglestone, Whitbrook, Leygue et al. 2011), investigated the rider experience of theme park rides where riders heart rates were recorded as a psychophysiological measurement of their experience to identify changes in physiological arousal such as feeling excited or anxious. This example illustrates how researchers in the field of HCI bring complex data sets together, in particular psychophysiological recording which was carried out beyond the conventions of an experiment design laboratory setting. The study illustrates how researchers apply their experiment design framework to capture and analyse complex data sets to gain an in-depth insight into the rider's changing narrative trajectory of the roller coaster ride Oblivion. This involved the triangulation of three data sets concerning the rider's roller coaster experience, which included a psychometric test, self-reports and recording real time changes in their heart rate (physiological data) through various stages of the ride experience.

An example of measuring viewer physiological responses to short film clips is presented in the study *Users' Response to Affective Film Content: A Narrative Perspective* (Canini, Gilroy, Cavazza et al. 2010), who investigated viewer physiological responses to changes in the formal components of film that included motion, sound and narrative events contained within each camera shot of a short film clip. They measured 8 viewers' physiological responses to 3 three short film clips (98.0-131.0 seconds) extracted from feature length films, by recording changes in their skin conductance level. Viewers' emotional responses to the film clips were also captured by each viewer completing a 5 level Likert scale questionnaire based on a pleasure-arousal psychology model of emotion. Although the study found a correlation between sound, motion and viewer physiological arousal, narrative elements and the viewer experience were more difficult to determine. They recommended further investigation into viewer responses to narrative elements and the formal components of filmmaking (e.g. editing). These examples demonstrate that the field of HCI is essentially an interdisciplinary field and provides a good example for this thesis to follow in its aim to understand suspense both physiologically and

textually in terms of cinematic storytelling, demonstrating the relationship between the two.

This thesis takes an HCI-inspired mixed methods approach to solving the problem of defining cinematic suspense in 21st century horror films. By drawing from film studies and media psychology I first identify the components of cinematic suspense in terms of cognitive states and emotions that are elicited during the construction of suspense and the temporal qualities in terms of suspense and cause-and-affect paradigm. This process then reveals the parameters and framework that can measure viewers' experiences of cinematic suspense and provided a valuable contribution to how we can quantify the phenomenon of cinematic suspense. Film scholars and media psychologists' recognition that suspense involves viewer physiological responses (Zillmann, 1996: 209-210), such as emotional sweating, biting finger nails (Zillmann, 1996: 209) or goosebumps (Benedek & Kaernbach, 2011). This then raises further questions to creating a measurable definition of cinematic suspense. Can we measure cinematic suspense by recording viewer psychophysiological responses? Can we develop and verify a psychophysiological model of suspense? How can psychophysiological responses provide an inductive rather than reductive meaning of cinematic suspense? How can viewers' psychophysiological responses provide understanding of how formal filmmaking components elicit suspense?

In answering these questions, this thesis defines cinematic suspense in 21st century horror films using a psychophysiological model of suspense. The findings from the 'Terror & Tension' film experiment demonstrate that by using electrodermal activity (EDA) as a means of monitoring viewer anxiety responses it is possible to gain a deeper insight into the relationship between the viewer's physiological response and cinematic suspense in terms of narrative structure and cinematic techniques. These research findings then serve to advance scholarly understanding of the phenomenon of cinematic suspense. The findings from the 'Terror & Tension' film experiment also offer a new understanding of electrodermal activity (EDA) in terms of the relationship between *phasic* skin conductance rise times (durability) and amplitude (intensity). The viewer's experience of suspense is then measured through *phasic* anxiety emotion

responses, which are elicited through fear stimuli presented in short horror film clips using four suspense narrative structures (vicarious, direct, shared and composite). I argue that these findings provide a new theory of psychophysiological measurement in terms of defining the viewer experience of cinematic suspense. This in-depth study then makes a significant contribution in terms of an HCI mixed methods approach to understanding viewer experience of cinematic suspense in 21st century horror films, creating a new paradigm of cinematic suspense for film studies and media psychology.

Structure of the Thesis

The thesis is divided into five chapters. Chapter one further develops our understanding of the experience of suspense and cinematic suspense covering scholarly work across the following disciplines: film studies, media psychology and psychophysiology. Building on this new understanding of cinematic suspense I was able to develop a framework of cinematic suspense based on cause-and-effect, event, cognition, emotion and physiology.

Chapter two sets out the mixed methods approach, techniques and procedures used to define cinematic suspense in 21st century horror films through experiment design ('Terror & Tension' film experiment). Building on the framework of cinematic suspense in chapter one I define the parameters that can be used to measure viewer experience of suspense and provide a framework for the experiment design. Drawing from best practice, methods, procedures and techniques from film studies, media psychology, psychophysiology and HCI are used to design the 'Terror & Tension' film experiment. This design process includes: the selection of horror feature films and short film clips, suspense narrative structures: vicarious, direct, shared and composite (Smith, S. 2000). I then complete a thorough investigation into the various psychophysiological recording techniques and select electrodermal activity (EDA) as the most appropriate technique to measure viewer anxieties to fear stimuli presented in 32 short horror film clips.

Chapter three demonstrates the mixed methods approach of triangulation in analysing three data sets from the 'Terror & Tension' film experiment: viewer EDA, viewer verbal feedback comments and textual analysis. The discussion provides a detailed breakdown of an EDA data treatment process to enable the development of the EDA model of suspense. This involved addressing the challenges of using EDA as a psychophysiological recording technique (e.g. skin conductance level signal drift) and also explanations behind mismatches between viewer feedback comments and EDA data. The EDA model of suspense measures viewer's psychophysiological experience of suspense, classifying the core component of suspense as a *phasic* anxiety response to fear stimuli in the horror film clips.

Chapter four applies the EDA model of suspense for measuring suspense to horror films by interrogating Susan Smith's suspense narrative structures: vicarious, direct, shared and composite. This involved an analysis of four film cases studies each one representing a suspense narrative structure that includes the convergence of three data sets: in-depth textual analysis of film clips, viewer EDA data and feedback themes and comments. The analysis and findings identify how each suspense narrative structure elicits suspense in terms of how the viewer is positioned in relation to fictional characters. This process also demonstrates how the EDA model of suspense accurately measures viewer's anxiety in terms of durability and intensity level and was successful in identifying the narrative aspects that elicit a weak or strong form of suspense during each film clip.

Chapter five turns to an interrogation to the formal visual and aural components of film through two themes that were closely associated with cinematic suspense. The first theme is the concealment, delay and revelation of story information. The second theme is the construction of empathy. These two themes provide a framework for how suspense is formed through the cinematic techniques of cinematography, sound and mise-en-scène in isolation, collectively and through repetitive patterns. The analysis across the two themes involves nine film clip case studies that are analysed by three data sets: an in-depth textual analysis of film clips, viewer EDA data and feedback

themes and comments. The EDA model of suspense focuses on how camera angles, movement, shots, lighting, sound and to a lesser extent mise-en-scène elicit specific anxiety responses in terms of durability and intensity.

This thesis challenges the misconceptions of cinematic suspense within theories from film scholars and media psychologists, in particular theories that perpetuate the cognitive state of uncertainty and emotions hope and fear as a perquisite to the experience of suspense. To avoid a definition of cinematic suspense being tautological I first define the key components of suspense that operates across genres of suspense and build a theoretical framework of cinematic suspense. By defining the psychological and physiological components of suspense assisted in the design of a framework that measures the viewer experience of cinematic suspense and provides an evidence based definition of suspense for 21st century horror films. This could not have been achieved without taking an innovative methodological approach that breaks away from the traditional qualitative or quantitative methods to defining cinematic suspense. The triangulation approach of using three forms of data: textual analysis, viewer EDA data, viewer themes and feedback comments, provides evidence to support the EDA model of suspense, providing a new understanding of the phenomenon of cinematic suspense in horror films and a valuable contribution to film studies and media psychology.

CHAPTER 1
Defining Cinematic Suspense

This thesis is about creating a framework to measure cinematic suspense and define viewer experience across different story contexts within 21st century horror films. Suspense is a multifaceted phenomenon, which has attracted a great deal of attention from film scholars and media psychologists interested in how suspense illuminates our experience though a fictional story world, such as watching a film, theatrical performance, playing a video game, or reading a book. Although suspense is a core process to the enjoyment and pleasure of a diverse spectrum of entertainment, the experience of suspense is complex involving specific cognitive, emotional and physiological states (Young, 2012; Zillmann, & de Wied, 1996; Friedrichsen 1996). Cinematic suspense can be defined through two core processes. First, encoding, which refers to the production of cinematic suspense through narrative and the formal components of filmmaking such as cinematography, sound, editing and mise-en-scène (Barsam, 2007). Secondly, decoding, which concerns how a viewer processes cinematic suspense (Barsam, 2007), through cognition, emotion and physiology (Young, 2012). On the surface this seems a simple process to explain; however, because it cuts cross the defined boundaries of encoding and decoding processes, the process becomes more complex upon closer examination.

Cinematic suspense is perceived by film scholars as a specific narrative device which can be defined through an in-depth textual analysis of feature films, in particular the suspense thriller (Rubin, 1999; Derry, 2001) or horror film (Hutchings, 2004). Although there are numerous definitions of cinematic suspense from film scholars (Carroll, 1990; Carroll, 1996; Yanal, 1996; Smuts, 2009) and media psychologists (Zillmann, 1996; de Wied, 1994; Brewer & Lichtenstein, 1982; Ortony, Clore and Collins, 1988), the discussion in this chapter will focus on definitions of cinematic suspense that are based on specific cognitive, emotional and physiological states. This line of enquiry is aligned with the film viewing experience, as Skip Young explains: 'Cognitive processes occur virtually simultaneously with emotional process and emotional reactions have physiological connections to thought patterns' (Young, 2012: 102). The discussion will attempt to tease out the core components of cinematic suspense in four categories: cognitive, emotional and physiological states, and the

film's temporal qualities involved in the construction of suspense. Although cognition, emotion and physiology are interwoven, working collectively as a whole in response to the temporal qualities of the cinematic text, by separating them we can gain a more in-depth understanding of how film scholars and media psychologists have defined cinematic suspense.

Cognitive States of Suspense

When watching a film the viewer cognitively makes sense of the plot by asking questions about the fictional story world concerning who the characters are and what their goals might be, and who is good and bad (Töpper & Schwan, 2008: 131).This cognitive experience invites the viewer to become involved with the characters and story world; a process that can be described as viewer engagement. This section will tease out the specific cognitive states that have been defined by film scholars and media psychologists as crucial to the experience of cinematic suspense. Alfred Hitchcock proposed that cinematic suspense heightens viewer engagement with the plot: 'suspense is the most powerful means of holding onto the viewer's attention. It can be either the suspense of the situation or suspense that makes the public ask itself 'What will happen next?' (Hitchock in Truffaut, 1985: 72). Although Hitchcock explains that suspense is a process that captures the viewer's attention regarding a story situation and/or prompting the viewer to ask what happens next, he does not explain what suspense is in terms of its cognitive and emotional states.

According to film scholars and media psychologists suspense occurs when the viewer mentally processes the plot and the story context and triggers two main cognitive states, anticipation and uncertainty. These cognitive states augment the viewer's concern about a specific story situation that produce an anticipatory stress reaction, such as the viewer being concerned about the safety of the protagonist(s) (de Wied, 1994; Zillmann, 1996). In regard to defining anticipation as a core component of cinematic suspense, François Truffaut describes Alfred Hitchcock's style of suspense as: '[his] particular style and the very nature of suspense require a constant play with the flux of time, either by compressing it or, more often, by distending it...Suspense, I take it, is the stretching out of an anticipation' (Truffaut, 1985: 72). Although Truffaut

defines Hitchcock's style of suspense as either compressing or extending 'anticipation' regarding the pace of the plot, Truffaut offers little insight into the type of anticipation that is expressed by the viewer when they experience suspense. Although, many film scholars and media psychologists argue that the cognitive state of anticipation is a core component of cinematic suspense (Carroll, 1996; de Wied, 1994; Norden, 1980; Truffaut, 1985; Zillmann, 1996), it raises the following question: What type of anticipation is involved in the construction of suspense?

According to Ed Tan, anticipations that are linked to cinematic suspense are associated with a specific story situations in a film, such as the protagonist's life being threatened by the antagonist (Tan, 1998: 99). Martin Norden explains that in this context anticipation is similar to a stress reaction in a real-life situation (Norden, 1980: 72), even though there is a big difference between being physically threatened in real-life and watching a film (Norden, 1980; de Wied, 1994). Norden goes on to say that anticipatory stress reactions to threatening real-life or fictional story world situations are stronger during the construction of suspense than experiencing the threatening event in real life or watching the threatening story event in a film (Norden, 1980: 72). Although Ed Tan, Martin Norden and Minet de Wied provide an insight concerning how the cognitive state of anticipation plays a significant role in the construction of suspense through an anticipatory stress reaction, according to Alfred Hitchcock, a strong anticipatory stress reaction is not necessary for suspense to occur because suspense is not necessary associated with fear (Hitchcock cited in Truffaut, 1985: 72) and suspense cuts across genres (Zillmann, 1996: 256). With a consensus amongst film scholars and media psychologists that the experience of suspense involves some form of anticipatory stress reaction (Zillmann, 1996; Zillmann et al.1994; Norden, 1980; de Wied, 1994), we can gain a deeper insight into different types of anticipatory stress reactions by exploring the cognitive state of uncertainty.

Many film scholars (Carroll, 1996; Yanal, 1996) and media psychologists (Zillmann, 1996; Ortony et al. 1988) argue that uncertainty concerning a specific story event outcome is essential to suspense. For example, if the viewer is certain that the protagonist will defeat the antagonist and survive, the viewer will not experience

suspense. However, if the survival of the protagonist is uncertain then the viewer is more likely to experience suspense through a strong anticipatory stress reaction (Tan, 1998; de Wied, 1994; Zillmann, 1996; Ortony et al. 1988; Carroll, 1996). Theories about uncertainty being essential to suspense have been based on the popular *cognitive theory of suspense*, developed by psychologists Andrew Ortony, Gerald L. Clore, and Allan Collins, and found in their book the *Cognitive Structure of Emotion* (1988). 'We view suspense as involving a Hope emotion and Fear emotion coupled with the cognitive state of uncertainty' (Ortony et al. 1988: 131). The *cognitive theory of suspense* is founded on prospect-based emotions of hope and fear that pertain to the cognitive state of uncertainty concerning a desired future outcome. This suggests that suspense is generated through conflict (uncertainty) between two outcomes: desirable (hope) and undesirable (fear). Although this theory creates a paradox (Carroll, 1996: 71), it has stood the test of time with many film scholars (Carroll, 1996; Uidhir, 2011; Yanal, 1996) accepting this definition of suspense without challenge.

The paradox concerns the importance placed on the relationship between uncertainty and the experience of suspense. If uncertainty is essential for suspense to occur, why do viewers appear to experience suspense on repeat viewings or readings of a story, when they know the outcome? Instead of film scholars challenging the *cognitive theory of suspense* and attempting to understand the core components of cinematic suspense, scholars shifted their attention to develop theories about the *paradox of suspense* (Carroll, 1996; Uidhir, 2011; Yanal, 1996).

Carroll defines the *paradox of suspense* in three ways:

1. Audience can only experience suspense when feeling uncertain about a desired outcome
2. Audience can experience suspense on repeat viewings.
3. Audience can experience suspense on repeat viewings even though they are certain about an outcome (Carroll, 1996: 73)

Carroll explains that the paradox occurs due to the contradictions of point 1 (uncertainty) and point 3 (certain); however, he still supports the notion that uncertainty is essential to suspense. 'There seems to be an agreement that a key component of suspense is a cognitive state of uncertainty' (Carroll, 1996: 71). In this

description, Carroll makes the assumption that the emotions fear and hope are essential to the experience of cinematic suspense, even though suspense has not been classified as an emotion owing to a lack of scientific studies (Kreibig, 2010: 408). According to Carroll, suspense occurs when the viewer is in the grip of uncertainty, combined with emotional involvement and a vested interest in a desired outcome that pertains to the protagonist. Robert Yanal argues that uncertainty is essential for suspense to occur because real-life suspense is an uncomfortable emotional experience, such as a patient being anxious before and after surgery. For Yanal, uncertainty provides the pain of negative thoughts, which ignite feelings of anticipatory stress when facing a possible life-threatening situation. During these moments of stress the patient might say, 'The waiting is the worst' (Yanal, 1996: 152).

However, Carroll and Yanal do not support their theories of uncertainty being essential to suspense with empirical studies of the viewers' experience of suspense and fail to recognise the importance of the viewers' prior knowledge of a film, such as through a movie trailer, which influences their expectations of what they will see happen in a film (Hoffner & Cantor, 1991). In addition, Barry Grant provides a genre perspective to the viewers' prior knowledge of a film when he states: 'What we collectively believe it to be and because we believe a genre to set up expectations that condition our responses to a genre film from the very first shot...often even before the lights have dimmed' (Grant, 2012: 134). According to Martin Norden, a viewer who has prior knowledge of a film that shows frightening or horrific scenes, will magnify, using their imagination, how these scenes unfold. By doing so, the viewer is likely to have a heightened level of an anticipatory stress reaction when they watch the actual scenes during the film (Norden, 1980: 72-73).

We will now turn to scientific evidence concerning prior knowledge and suspense. Norden explains his theory using the work of Robert Birnbaum, in an unpublished thesis *Autonomic Reaction to Threat and Confrontation Conditions of Psychological Stress* (1964, cited in Nomikos et al. 1968). The study investigates how prior knowledge may actually increase anticipatory stress. Birnbaum used a Health & Safety film *It Didn't Have to Happen* (George Gorman, 1954), which contained different

wood mill accidents involving serious injury and death. In one of the films, the viewer first sees a workman in the wood mill with a finger missing; when his colleagues notice the missing finger, the man explains to them how the accident occurred. Then a pre-accident flashback is shown to participants and, because participants have prior knowledge that he loses his finger in a work related accident, viewers experienced a high stress reaction when he starts operating a tool in the workshop. The recording of their physiological responses, heart rate and skin conductance (electrical changes in the skin) showed a sudden increase in physiological arousal, with an additional increase occurring when seeing the workman lose his finger, followed by a sharp decline. The study concluded that participants experienced higher levels of physiological arousal during the anticipatory period before the accident occurred, which is similar to how viewers experience the construction of suspense to a fear stimulus in horror films (Zillmann, 1996; Zillmann & de Wied, 1996). This study informs us that, in specific situations, uncertainty is less likely to be essential to the experience of suspense.

In regard to prior knowledge of a film, we can draw from the serial films made in the early 20th century, which used the narrative device of the cliff-hanger to heighten suspense and entice viewers back into the cinema. The actress Pearl White, who played Pauline in *The Perils of Pauline* series, became synonymous with the cinematic version of the cliff-hanger (Goldthorpe & Goldthorpe, n.d.). Although each episode ended with Pauline facing a life-threatening situation, she miraculously survived on each occasion. *The Perils of Pauline* was famous for eliciting high levels of suspense (Judson, October 3rd 1914: 43) even though the viewers knew from watching previous episodes that she would survive, which questions the levels of uncertainty required for the viewer to experience suspense. Based on the theories discussed here that identify uncertainty as the key cognitive component of suspense, illustrates that there is a misunderstanding of the role of uncertainty in suspense (Zillmann, 1996). By considering the examples discussed here from film studies, media psychologists and the scientific community there is much evidence to indicate that uncertainty is not always essential for suspense to occur. We shall now turn to the emotional states of cinematic suspense.

Emotional States of Suspense

When the viewer becomes actively engaged in the plot and story world they start to process different emotions (Töpper & Schwan, 2008:131). Frank Krutnik argues that in order for the viewer to experience suspense they have to invest imaginatively and emotionally in fictional characters and their challenging situations, which need to be resolved:

> ...suspense describes the means by which the reader is cognitively and emotionally hooked into – and by – the fiction. It involves questions not only of what happens or what will happen within a narrative, but also of how readers or audiences are placed, played, and engaged by textual processes (Krutnik, 2013: 11).

Krutnick explains the importance of the viewers' cognitive and emotional involvement in the plot and story world and how the cinematic text engages and holds the viewers' attention. Although cognition is a process concerning how we mentally process information, according to Greg Smith, emotion is a faster process (Smith, G. 2007), for example, the emotion fear is about action avoidance from a threat or danger that we instinctively act upon (Eitzen, 2010). For Ed Tan emotion is a meditating process that involves a variety of psychological events, including appraisal and the initiation of action, which do not necessarily follow a linear process, and they may overlap. When we consider emotion as a mediation process, it mimics the construction of suspense in terms of causality and appraisal of a story event (Bordwell, 1985; Zillmann, 1996; Brewer & Lichtenstein, 1982), even though suspense is not classified as an emotion (Kreibig, 2010).

The discussion will now focus on how film scholars and media psychologists have defined specific emotions as components of suspense. In the first instance, we return to the *cognitive theory of suspense,* by Ortony et al. (1988), where the emotions hope and fear concern a specific future outcome in the story world. Hope is often associated with the experience of suspense when the viewer invests in the protagonist's goals and when they need to overcome a life-threatening situation. However, the emotion hope is not always essential when the protagonist experiences a life-threatening situation in a horror film. This is because horror films, as Mark Jancovich explains, are: 'Basically concerned with a process of terrorization in which a serial killer methodically murders

a group of teenagers one by one'…(Jancovich, 1992: 104-105). This informs us that when the viewer is aware of this genre convention they are less likely to experience hope when they know most, if not all, of the protagonists will be killed, even though the viewer can still experience an anticipatory stress reaction when a protagonist is either being chased or about to be killed by the antagonist (Hutchings, 2004; Zillmann, 1996). In other words, even when the viewer does not experience hope for the survival of a protagonist they can still experience suspense through a strong anticipatory stress reaction to other specific story situations in the film, in particular when a threat from the story world is directed at the viewer (Smith, S. 2000: 22-25).

Turning to the problems of contradiction associated the *cognitive theory of suspense,* Christy Mag Uidhir takes a different approach to the *paradox of suspense* to Noel Carroll and Robert Yanal, by suggesting that film theorists masquerade suspense as a unique, genuine emotion such as fear or anger. He calls this approach *suspense realism*, which focuses on resolving the *paradox of suspense* by classifying suspense as an emotion. According to Uidhir, *suspense realism* cannot provide a correct theory of suspense, because suspense has not been classified as a distinct emotion like fear, happiness, sadness and contempt. Therefore, participants in research studies misidentify suspense using other classified emotions such as anxiety. According to Uidhir, what creates the paradox is the perception that suspense is a distinct emotion, but by removing this notion the paradox dissolves (Uidhir, 2011: 168-169). Although Uidhir's argument appears to be based on scientific evidence, he does not explain what models of emotion he is referring to or even attempt to justify his theory with any empirical studies.

Turning to the association between suspense and the emotion fear, Alfred Hitchcock claims that suspense has 'no relation whatsoever' to fear (Hitchcock cited in Truffaut, 1985: 72) and provides evidence from his film *Easy Virtue* (Alfred Hitchcock, 1928): A telephone operator listens into a conversation, where a man is proposing marriage; both man and woman, are not being shown on screen. Instead the camera focuses on the operator, who feels suspense because she is keen to hear the woman accept his proposal of marriage. The operator is in anticipation, not fear, while she awaits her

answer and is relieved when the woman accepts his proposal (Hitchcock cited in Truffaut, 1985: 72). Based on Hitchcock's example, cinematic suspense can be adapted across genres and thus quash suspense theories that assume fear is essential to suspense. This also indicates that cinematic suspense operates through different driving emotions, depending on the story context and genre. For instance, Hitchcock's example of the operator will elicit an anticipatory stress reaction at a lower level of intensity than watching a scene from a horror film (Zillmann, 1996), where fear acts as a *tonic* emotion (Tan, 1998). This will be discussed in detail later. If the emotions of hope and fear, in addition to the condition of uncertainty, are not essential in the construction of suspense, then this seriously undermines the credibility of *cognitive theory of suspense* by Ortony et al. 1988a. This also demonstrates that the *paradox of suspense* appears to be an illusion, perpetuated by film theorists who define cinematic suspense to suit the *cognitive theory of suspense* paradigm (Ortony et al. 1988: 131), leading to misconceptions concerning the components of suspense. We shall now turn to exploring other emotions that are associated to the experience of suspense.

According to Ed Tan, the emotion interest is essential to the experience of suspense, because interest is a prerequisite of viewer engagement in the story world. Tan goes on to say that when suspense occurs, it increases viewers' interest in terms of levels of intensity (Tan, 1998: 209). This relationship between interest and suspense also illuminates Tan's theory based on two types of emotion that occur in film viewing, which he names as *tonic* and *phasic* emotions. *Tonic* emotions operate in the background and last for long periods during the film with varying levels of intensity (Tan, 1998: 83). *Phasic* emotions last for shorter periods of time, such as in a short film sequence, which can be used to heighten the viewers' interest and that more than one *phasic* emotion can occur within the same story event (Tan, 1998: 199). This is significant, bearing in mind that the construction of suspense can occur within a short time frame in seconds (Tan, 1998; Nomikos, Opton Jr, Averill et al. 1968), indicating that suspense can act as a *phasic* emotion (Tan, 1998: 209). This is because *phasic* emotions heighten interest and 'respond to changes on the way to a desired situation' (Tan, 1998: 199), which is very relevant to how emotions operate during the construction of suspense. Tan describes anxiety as a *phasic* emotion, which is closely

related to the experience of suspense (Kreibig, 2010: 408). When we take into consideration that different levels of anticipatory stress occur during the construction of suspense, this further supports the idea that suspense is a form of anxiety (Kreibig, 2010: 408). Therefore, with suspense acting as a *phasic* emotion, anxiety is more likely to be the generic emotion during the construction of suspense, driving the intensity level of the *tonic* emotion of interest. Depending on the film genre and story context, other emotions also play a role in the construction of suspense such as in a horror film, where the viewer will experience fear as a *tonic* emotion to support their mood of feeling frightened and also fear as a *phasic* emotion, when a specific fear stimulus triggers an anxiety response and the construction of suspense.

Furthermore, viewers' emotions that occur during the experience of cinematic suspense are often elicited vicariously through fictional characters in the story world, in particular with the protagonist(s). Therefore, viewer engagement is dependent on some form of identification with fictional characters (Cohen, 2001: 245). Dolf Zillmann explains: 'Whatever mechanism is presumed to mediate the respondent's affective reactions, suspense can manifest itself only through the anticipation of outcomes that either endanger or benefit others (i.e. protagonists or other members of the cast)' (Zillmann, 1996: 201).

Dolf Zillmann provides a generic framework for suspense in drama:

1. Suspense drama must preoccupy itself with negative outcomes
2. Liked protagonists who deserve to have a good life must be selected to experience life-threatening situations in order to make these outcomes feared by the audience
3. High degree of subjective certainty (rather than uncertainty) about the occurrence of outcomes that threaten the liked protagonist
   (Zillmann, 1996: 201)

Zillmann's framework of suspense draws attention to the importance of the viewer's relationship with the protagonist. For Zillmann, suspense occurs when the viewer supports the interests of a liked protagonist; this nearly always involves the viewer experiencing suspense when the protagonist is in a life-threatening situation with the antagonist. Although this suggests some form of identification between viewer and

protagonist, without a concise definition of identification this theory becomes problematic when attempting to measure viewer responses (Cohen, 2001: 250). Cohen proposes a theory of how identification can be measured by its key components: cognition, emotion, motivation, and absorption. Cohen argues that we cognitively understand a fictional character by sharing their perspective within the story world and begin to empathise with them through events they experience in the fictional world. Motivation follows as the viewer becomes deeply involved in the character goals, which allows them to become absorbed in the fictional character's life as it was their own (Cohen, 2001: 256).

Other theorists (Tan, 1998; Carroll, 1990; Zillmann, 1994), take the view that identification is not the right terminology and is misleading, because the viewer and protagonist cannot share the same cognitive and emotional experience. Zillmann illustrates these differences between viewer and protagonist in Hitchcock's prototype of suspense, where the viewer has information that is hidden from fictional characters that could threaten their lives. He provides the example of a couple who are in deep discussion while walking in the direction of a deep hole in the pavement, oblivious to the danger ahead. However, the viewers experience anticipatory stress because they are concerned the couple will fall into the hole and become seriously injured. Therefore, because the couple and viewer experience different emotions, the viewers do not strongly identify with the couple. Zillmann points out that viewers' reaction to the couple's plight was a form of empathetic response and would be similar if the incident had happened in real-life. Similarly, according to Ed Tan, this example of suspense would elicit an intense empathetic response, such as empathetic fear (Tan, 1998: 185-186), because the viewer is desperate to warn the couple of the danger and cannot do so.

Therefore, the connection between viewer and protagonist is more likely to be based on empathy rather than identification (Zillmann, 1994: 37). This is illustrated in a study of *Empathic Distress in the Enjoyments of Cinematic Tragedy* (Zillmann, de Wied & Ordman, 1994). Participants that scored highly on empathy experienced higher empathic distress while watching a film than participants with low levels of

empathy. Furthermore, high empathisers actually enjoyed the film more than low empathisers. Zillmann explains that in order to increase an empathetic connection, character development of the protagonist is essential and that the viewer needs to relate to them like a close friend, while the antagonist plays the enemy, who intends to harm the protagonist. Once these affective dispositions are generated through story events, the viewer is invited to become emotionally engaged with the protagonist and story world. Empathic distress is then generated when the protagonist's life is in danger from the actions of the antagonist or through another form of threat to their life (de Wied, 1994; Zillmann et al.1994).

Turning to scientific evidence concerning how we empathise for others who are in a state of pain and suffering, the study *Negative emotional responses elicited by the anticipation of pain in others: psychophysiological evidence* (Caes, Uzieblo, Crombez et al. 2012) found that when participants were exposed to imagery of people in pain, participants' physiological responses indicated that they experienced a fear response, which declined for participants who had psychopathic traits (Caes et al., 2012). This indicates when viewers watch a specific fictional character's face in close up and who expresses their pain or suffering through facial expressions, the viewer is more likely to respond to their emotional state with an anxiety (Caes et al. 2012) and empathetic response (Kydd, 2011: 120), unless they are low on the empathy spectrum (Baron-Cohen, 2011).

Although the viewer experiences cinematic suspense through an empathetic response to fictional characters, because of meaning-making viewers draw from their situation (Tan, 1998), suspense is not *reliant* on the viewer feeling empathy for a fictional character. According to Ed Tan the viewer can experience 'imagined-self empathy' when the viewer is privileged with information about a fictional character's life being in danger while at the same time the character is oblivious to any danger. Tan goes on to say that 'imagined-self empathy' invites the viewer to place themselves in the character's situation as if they are facing the same situation (Tan, 1998: 185). This kind of absorption in the story world is also called narrative transportation where the

viewer feels they are a non-participatory character in the story world (Green & Brook, 2000: 701).

An example of a weak empathetic response occurs when viewers watch a horror film and are aware of the film's genre convention in that many fictional characters will be killed by the antagonist (Jancovich, 1992) and are therefore less likely to invest emotionally in the characters' goals and concerns, leading to a weaker empathetic response. Furthermore, suspense is not always associated with the viewer's emotional involvement with fictional characters in horror films, where threats from the story world are often instead directed at the viewer to scare them via three means. First, though narrative structure where the viewer watches a scene in the first person point-of-view and a threat is directed towards camera and viewer (Smith, S. 2000). Secondly, through the formal components of film making, using cinematic techniques, such as the viewer hearing a discordant threatening off-screen diegetic sound that represents the presence of a non-visible antagonist (Hutchings, 2004: 129-132). Thirdly, lighting, where darkness hides unknown dangers (Cantor & Oliver, 2004: 229), thus, increasing viewers' anxieties, because the dark triggers our primordial sense of fear and vulnerability to what is hidden, unknown and possibly life threatening (Eitzen, 2010). These examples illustrate how fear is a major component to suspense in horror films and informs us that cinematic suspense is essentially an anxiety response attached to a specific story context that is driven by an emotion (e.g. fear in horror).

We shall now turn to how we develop a deeper absorption into a fictional story world which may intensify suspense. This occurs when the viewer shifts their perspective of reality and replaces it with a fictional one (Metz-Lutz, Bressan, Heider et al. 2010 :1). This theory was first proposed by Samuel Taylor Coleridge in his autobiography *Biographia Literaria* (1817). His philosophical definition of engagement with fiction was the willing suspension of disbelief. In a scientific study to test Coleridge's theory, Metz-Lutz et el., (2010) used function magnetic resonance imaging (fMRI) to record participants' brain activity while they watched a live theatrical play and discovered that participants experienced a subtle alteration in consciousness, similar to an hypnotic state, as they became immersed in the play, leading to '...a change in the state

of the viewer's consciousness of live drama and enabling them to adhere to the fiction' (Metz-Lutz et al. 2010: 9). Therefore, the results of the study indicate that when a viewer watches a theatrical play, it alters their state of consciousness in a way that corresponds to Coleridge's theory.

According to Barry Grant, Coleridge's theory is more aligned to cinematic experience, because filmmakers have perfected techniques in cinematography, sound and editing to make a fictional story appear larger than life:

> The viewers willing suspension of disbelief and propensity for character identification for example, are especially encouraged in the cinema, where one experiences images and sounds larger and louder than life (it is just this ability of cinema to "magnify" reality that explains the medium's apparent affinity for the melodramatic, the fantastic and the spectacular – modes that tend to magnify reality in different ways) (Grant, 2012: 133)

This suggests that cinematic suspense triggers a temporal state, where the viewer is absorbed cognitively and emotionally within the fabric of the story, actions, characters and story events. This now brings us to how the viewer reacts physiologically when they are in a state of suspense.

Physiological States of Suspense

Media psychologist Minet de Wied argues that 'suspenseful drama commonly employs suggestions of potential distress to create suspense' (de Wied, 1994: 109). This view is also supported by media psychologist Zolf Zillmann when he writes, 'Suspenseful drama, then, appears to thrive on uneasiness and distress about anticipated negative outcomes. Put more directly, it thrives on fear-on empathic fear, to be precise' (Zillmann, 1996: 203). These short definitions of cinematic suspense draw from the historical context of suspense where it was initially associated with fear and public tragedy. This type of cinematic suspense is, then, more than likely to elicit a strong anticipatory stress reaction and anxiety response that leads to the creation of physiological states.

Barry Grant argues that dramatic film sequences can elicit specific physiological states in the viewer:

> While the viewing a film one is able simultaneously to say something to the effect of "It's only a movie," yet also have distinct physiological responses – sweaty palms, for instance or an unsettled stomach in a sequence like the car chase through sloping streets of San Francisco in *Bullitt* (Peter Yate 1968) (Grant, 2012: 133)

Barry Grant's example illustrates how the viewer is well aware of their surroundings in that they are watching a film, yet they still experience specific physiological responses to the film sequence of a car chase. When we consider that suspense in a horror film is synonymous with the emotion of fear (Carroll 1990), then this suggests viewers are more likely to experience a strong anxiety response and alters their physiological state (Zillmann, 1996: 276-277).

Psychologist René Misslin explains that when we experience fear or become anxious, the amygdala (fear response centre) in the limbic system of the brain instinctively mobilises the fight-flight body defence system. The fight-flight response produces specific actions to defend (fight) or withdrawal (flight), through a complex neural network, activating the autonomic nervous system (ANS) to provide the necessary bodily responses to deal with the perceived danger (Misslin, 2003 :60). This suggests that when we perceive fear, regardless of the activity or event, our body instinctively generates physiological changes, combined with cognitions and emotions to produce immediate appropriate coping strategies to deal with the threat (Lazarus, 1993: 4).

Dolf Zillman explains that the viewer physically reacts when in the grip of suspense: 'Suspense drama has, no doubt, the capacity to engage our emotions. Respondents subjected to 'torturous' suspense scenes have been observed to break out in a sweat, bite their fingernails...' (Zillmann, 1996: 209). This view is supported by Skip Young, who argues that we become emotionally aroused when engaged with the cinematic experience producing physical reactions: '...expressions of terror and jolts of surprise...' (Young, 2012: 102), while Barry Grant suggests we get sweaty palms when we experience high tension, as indicated in the earlier example of the car chase in *Bullitt* (Peter Yate, 1968). These views are further supported in a study about the experience of chills, which is associated with the experience of cinematic suspense in horror-thriller films as a response to fear. Studies suggest that chills are subjective

experiences that activate physiological states, such as goose bumps appearing on the skin, sending a quiver effect down the spine and making hairs on our back and arms stand upright (Benedek & Kaernbach, 2011; Cutts, Lee, Berarducci et al. 2002). This physiological phenomenon is called piloerection, which is perceived as an inherited defence mechanism from our distant ancestors, and is activated when we feel a threat of danger (Benedek & Kaernbach, 2011: 320). Therefore, piloerection is a physiological state produced by our body's defence mechanism when we feel the presence of danger or fear; consequently, it is not surprising that piloerection occurs when viewers watch a horror film.

To gain an insight into the physiological responses of suspense, we can draw on studies that have investigated participants' physiological responses to other forms of entertainment, where suspense is crucial to enjoyment and pleasure. For example, the experience of thrill is associated with suspense, triggered by high risk, fear and danger (Konečni, Wanic and Brown, 2007). In a study *Personalizing the theme park: Psychometric profiling and physiological monitoring* (Rennick-egglestone et al. 2011), researchers in the field of Human Computer Interaction (HCI) measured thrill seekers' experiences on the Oblivion ride at UK theme part Alton Towers. They hypothesised that heart rate is related to sympathetic activity from the sympathetic nervous system (SNS), which would provide a physiological dimension to measure riders' responses to fear and excitement, the core elements of thrill. The experiment measured riders' heart rate responses to different phases of the ride experience, which revealed variations in heart rate at each phase of the roller coaster ride, from arrival at the ride, the start of the ride (lift-hill), the 60 foot vertical drop and remainder of the ride. Interestingly, the study discovered the highest heart rate and sympathetic activity occurred when participants arrived for the ride. Therefore, the study concluded it was when riders were waiting for the ride that they experienced the highest physiological arousal due to being scared and/or excited about the ride experience (Rennick-egglestone et al. 2011: 9). This suggests that some of the riders when waiting for their ride experienced a form of suspense based on anticipatory stress and fear, which occurs when viewers experience cinematic suspense when watching horror films (Zillmann, 1996).

However, as Frank Krunik explains, '…cinema differs from other participatory activities – riding rollercoasters, climbing mountains, tightrope walking, dangerous sports, and so on – because the viewer experiences suspense as an extreme sensation vicariously, without risking actual physical involvement or physical threat' (Krutnik, 2013: 11). Although the vicarious form of cinematic suspense is different to the above participatory activities, suspense is still a crucial component in participants' enjoyment of them, as explained in the Oblivion rollercoaster example, where the study found most riders experienced a form of suspense while waiting for the ride (Rennick-egglestone et al. 2011: 9). Sports spectators watching their favourite team also experience suspense during the build-up to the final result of the game (Knobloch-Westerwick.S, et al. 2009) and basketball players after they have thrown the ball towards the basketball hoop and then await to see if they have scored (Smuts, 2009: 284).

Cognitively, emotionally and physiologically each activity holds the participants' or observers' attention and interest through a goal-action oriented process of anticipatory stress reaction and excitement, the trademark of cinematic suspense (Zillmann et al. 1994). This indicates that the underlying difference of the experience of suspense between participatory activities and watching a film, must involve different cognitive processes that are associated with each activity and how they form emotionally and physiologically responses accordingly to the perceived threat or risk involved. In other words, we cognitively appraise the activities differently, so emotional and physiological responses trigger appropriate coping strategies for each activity (Lazarus, 1993: 4). From a physiological perspective, all of the activities listed by Krutnik will generate a strong anticipatory stress reaction and anxiety response when the viewer, sports spectator or active participant experience suspense. However, Barry Grant argues that the way in which the viewer becomes absorbed in the story world when they experience cinematic suspense could produce even a stronger anticipatory stress reactions than the other activities, because it elicits extreme sensations and emotions through an artificial reality created by stylistic devices that magnify reality larger than life (Grant, 2012: 133). We shall now turn to the process of cinematic

suspense though its temporal qualities that trigger cognitive, emotional and physiological responses.

The Temporal Qualities of Suspense

In this section the discussion will focus on defining suspense as a mediation process through the temporal qualities that represent a specific story event sequence. The temporal qualities that relate to the construction of suspense through narrative structure and cinematic techniques such as cinematography, sound, and mise-en-scène will be discussed in-depth in chapters 4 and 5. The discussion here will focus on three key areas that illustrate cinematic suspense is a specific type of mediation process. First, though 'pacing' the timing structure of suspense, which Truffaut described as the compressing and extending of time (Truffaut, 1985). Secondly, how narrative information elicits suspense in terms of plot development and how the viewer makes sense the plot by asking questions and making assumptions about specific narrative events. Thirdly, how suspense is created through a specific narrative event structure of an initiating story event that elicits suspense which is later resolved by an outcome event. Fourthly, how psychologists have attempted to measure cinematic suspense.

The time structure of the construction of suspense concerns the pace of the narrative information and, according to film director Mark Livolsi, it consists of different film editing techniques (Mark Livolsi cited in Oldham, 2012: 14). This involves timing of a film sequence, when it appears during the plot, duration of camera shot and rhythm of cutting (editing). However, pacing is often referred to as the manipulation of time, extending or compressing, to create viewer affect. According to Hitchcock, the construction of cinematic suspense is about holding the viewer's attention mostly through the stretching of time (Hitchcock cited in Truffaut, 1985). Whereas Sijll Van explains that the pace of the story does not need to be slow to elicit suspense. The rhythm of fast intercutting between two scenes can create suspense more rapidly to heighten suspense (Sijll Van, 2005: 72). With the core emotion of cinematic suspense being anxiety, then pacing of the plot is essential for mediating the anxiety response through compressed/extended time or intercutting between scenes. For example, a story event first elicits suspense, triggering an anxiety response in the viewer, which

continues until suspense has been resolved. Although editing plays an important role in the pacing of suspense, the way in which the viewer mentally process the plot provides another temporal element of cinematic suspense.

David Bordwell has developed a model of narration based on Russian formalists' theory of narration: it proposes a cause-and-effect paradigm represented by the chronological order of events in a film that are linked together though a pattern of time and space (Bordwell, 1985: 49). These events trigger cognitive processing and the viewers' imagination to construct the story (fabula) through viewers raising questions about story events, making assumptions and having expectations about future events and also testing their assumptions/expectations. Bordwell calls this process hypotheses testing about past story events (Bordwell, 1985: 49). Bordwell goes on to say that the fabula is never presented in the cinematic text, a book or play, instead it is created by the viewers' perception of a story structure and their assumptions and expectations of what may happen in the story world. Bordwell points out that it is the plot (syuzhet) that presents the different story events to the viewer, such as characters, actions, scenes and key plot changes, with the syuzhet consistently concealing or delaying story information to the viewer to support the construction of the fabula (Bordwell, 1985).

This is of particular interest to the construction of cinematic suspense, because when the syuzhet provides too much or too little story information, it can diminish the impact of the fabula and diminish suspense. Bordwell explains: 'We have already noted the overall importance of retardation in cueing the spectator's comprehension. Only by laying the revelation of some information can the syuzhet arouse anticipation, curiosity, suspense and surprise' (Bordwell, 1985: 55). One example of how the syuzhet conceals information from the viewer to elicit suspense is through lighting. Joanne Cantor and Mary Beth Oliver explain how the lighting plays an important role in concealing or delaying information to the viewer that triggers suspense in horror films: 'Darkness, obscured vision and ominous shadows are visual elements that we are predisposed to fear and that are also prevalent in horror films' (Cantor & Oliver, 2004: 229).

William Brewer and Edward Lichtenstein identified specific narrative event structures for stories, suspense, surprise and curiosity, which were based on viewer enjoyment. In a study, *Stories are to Entertain: A structural-Affect Theory of Stories* (Brewer & Lichtenstein, 1982), three different theories were identified that explain how we understand narrative. These are plan comprehension (the way we interpret the observations of actions of another person's intentions), narrative comprehension (the ability of how we understand narrative) and story schemas (individual knowledge and enjoyment of stories). Plan comprehension is nuanced with story schema, because they are a core element to understanding a story, as they provide key elements and sequences of dramatic events and fictional characters.

Brewer and colleagues created a series of experiments to investigate plan comprehension and memory. They discovered that participants naturally use a plan schema to understand and memorise elements from a story and that we remember goal-oriented action sequences like suspense, more than non-goal oriented action sequences (Brewer & Lichtenstein, 1982: 474-475). Brewer & Lichtenstein (1982) argue that narrative comprehension helps us understand the wide spectrum of different narratives we consume, such as historical texts, stories and magazine/newspaper articles. According to Brewer and Lichtenstein, narrative comprehension has several sub-classes concerning the meaning of the text, which they call discourse forces. However, Brewer and Lichtenstein make the assumption that the primary discourse force for stories is entertainment, therefore, to understand viewer response to a story we would measure the structural elements of the story that lead to enjoyment. This hypothesis was the foundation of the *Structural Affect Theory*, where Brewer and Lichtenstein measured participants' affective responses to written texts and related these to enjoyment of the story. From the results of this study, they proposed that there were three clear major story event structures that encouraged participant enjoyment in most stories: suspense, surprise and curiosity, which operate within a specific event sequence.

Brewer and Lichtenstein explain how these event structures work and how distinctly different they are in their operation. Suspense is a narrative process driven by an

important initiating event that relates to a specific fictional character and which will produce a significant outcome, either good or bad. Additional story events between the initiating and outcome event are utilised to construct suspense with the outcome resolving that suspense (Figure 1).

Brewer provides an example of suspense using a bomb event structure:

1. *Alfred H. put a bomb under the table.*
2. *Three men came into the room.*
3. *The men began playing cards.*
4. *The men were taking about the weather.*
5. *The bomb under the table exploded killing the men* (Brewer, 1996: 113).

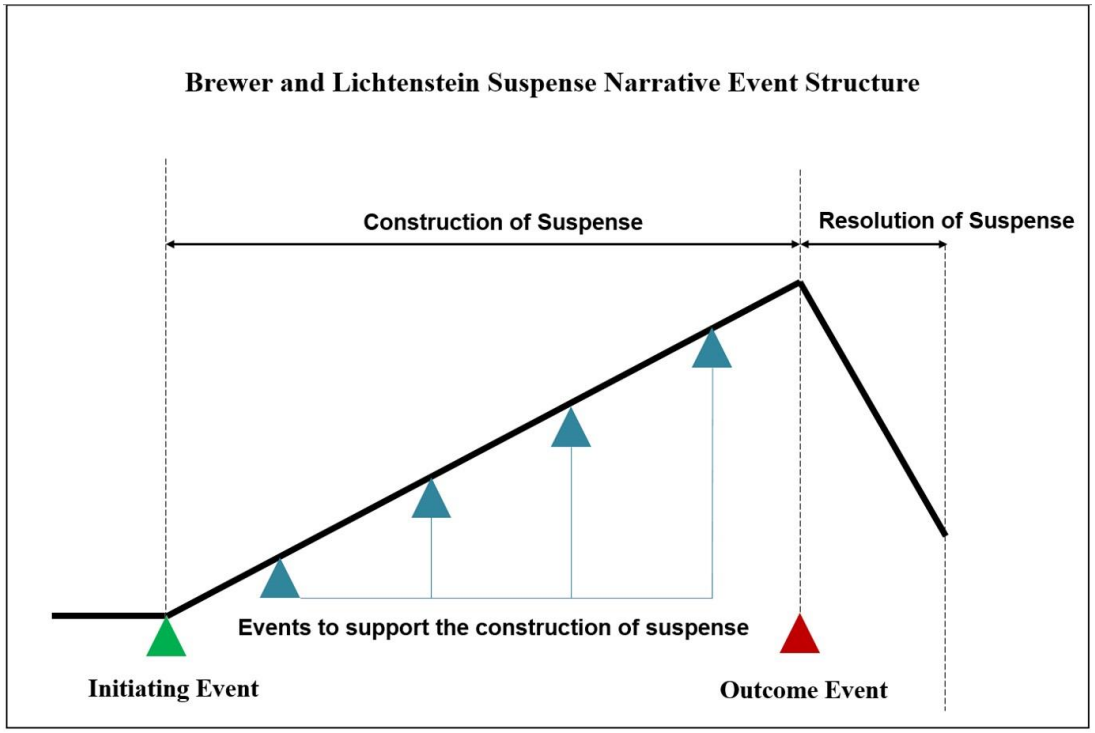


Figure 1.1. A graphical representation of the construction of suspense.

However, this suspense narrative process creates the assumption that suspense is a gradual build up to a climax point when the outcome event is presented and suspense is resolved with either a positive or negative outcome for one of the fictional characters. What is problematic about this graphical representation of the suspense curve is that story events (2-4) may heighten suspense before the outcome event and

that a negative final outcome for the fictional character may actually heighten suspense rather than resolve suspense. The additional story events (2-4) that occur during the construction of suspense could create a more complex pattern of suspense where they could act as separate initiating events forming new outcome events. This indicates that a pattern of initiating events an outcome events could create nested suspense event structures that overlap each other or both. However, Brewer and Lichtenstein's suspense narrative event structure does offer a framework for measuring suspense through an initiating event (IE) and outcome event (OE).

We can also consider Brewer and Lichtenstein's other two narrative event structures, surprise and curiosity, as these potentially could occur during a suspense film sequence (Wirth & Schramm, 2005: 11). Surprise is created through a sudden and unexpected event in the story sequence, and which is commonly used in horror films to scare the viewer. Surprise is resolved by the viewer reflecting on the narrative information from the event sequence and what was leading up to the surprise event. Curiosity is similar to surprise, because the viewer does not see the significant event at the beginning of the event structure, instead, they are provided with enough clues that the event is missing. This allows the viewer to become curious about the information that is withheld. Curiosity is resolved when there is enough information in the later parts of the event structure, so the viewer can reconstruct the missing event.

Suspense and surprise can be interwoven together; in horror films surprise acts a form of a shock, which can elicit a suspenseful sequence. The initiating event (IE) could occur through the sudden appearance of the antagonist launching a surprise attack on the protagonist, but with the protagonist quickly escaping, constructing a suspense sequence with the antagonist chasing after the protagonist. Suspense can also be resolved by a surprise outcome event (OE), such as the sudden appearance of the antagonist who attacks and kills a fictional character. These examples indicate how surprise can elicit or resolve suspense during a scene or film sequence.

In regard to time structure of suspense, Minet de Wied (1994) argues that timing is an essential aspect of narrative structure, in terms of how dramatic story events unfold.

The time structures of textual elements within the story are: characters, actions and events, while the formal components of film making (cinematic techniques) provide the aesthetics, time and form, such as composition, camera motion, type and duration of shot, colour, sound and lighting. As mentioned earlier, editing provides the filmmaker with control of the order and duration of story events and what is presented on screen. De Wied explains that to understand suspense narrative structure we need to define the relationship dynamics between viewer expectations and how the construction of suspense builds over time when the viewer watches a threat in the fictional story world that is either directed at the protagonist and/or themselves.

In a study *The role of temporal expectancies in the production of film suspense* (1994), De Wied found that manipulating these temporal differences between actual and expected outcome of any event may add or decrease suspense (de Wied, 1994). The results of his study found that when viewer expectations were exceeded, participants experienced higher levels of suspense than those which conformed to viewer expectations. In addition, suspense is heightened when the outcome is just about to be revealed rather than when outcome event actually occurs (de Wied, 1994: 113). De Wied also found that manipulating the temporal succession of break points (the initiating event and outcome event during scenes) in the story structure, reduces or increases suspense, because it influences the duration of suspense and, in particular, when the outcome is revealed to the viewer. Based on the results of the study, de Wied proposes the following definition of suspense: 'suspense in film can be described as an anticipatory stress reaction, promoted by an initiating event in the discourse structure and terminated by the actual presentation of the harmful outcome event' (de Wied, 1994: 111). De Wied's definition of suspense provides a useful framework to measure suspense, in particular the viewer's anticipatory stress reaction and the time structures to suspense when a threatening stimulus is presented in the story world.

In the study, *Surprise versus Suspense in the Production of Stress Reaction* (Nomikos et al. 1968), researchers investigated different time relations between surprise and suspense events, where participants were faced with a threatening stimuli. The experiment used the same Health & Safety film *It Didn't Have to Happen* (1954), as

in a previous example by Robert Birnbaum. This study created different timing structures from three industrial Health & Safety films, each depicting a workshop related accident involving a milling machine, circular saw and planner. They defined suspense an anticipatory stress reaction to watching a harmful event. The timing of films 1 and 2 were manipulated to create two separate films, wood planner accident (finger lacerations) and milling machine (loss of fingers). Each film had a short duration of anticipation (surprise), while the second film had a longer duration of anticipation (suspense). The third accident acted as a control in regards to the modifications made in film 1 and 2. However, the magnitude of the accident in film 3 was much greater than films 1 and 2, as participants watched a workman being killed.

This film was also not manipulated with additional or deleted scenes like films 1 and 2. Researchers hypothesised that films with the longer duration would lead to higher and longer stress levels (suspense), as participants would have time to appraise the threatening stimuli, elicting coping strategies or allowing their imagination and prior knowledge to magnify the stress levels, as they wait for the impending threat to occur. It was expected that the shorter duration of anticipation in film 1 (4.3 seconds) and film 2 (6.6 seconds) would not produce high stress reactions, because the viewer would perceive the fear stimuli as a sudden shock (surprise). This was later confirmed with the results from the study, suggesting long periods of anticipation in films 1 and 2 produced higher physiological arousal, as indicated by viewer skin conductance levels, than in the shorter version of the films. In regard to the duration of long periods of anticipation, the duration of film 1 was 25.7 seconds and in film 2, 18.7 seconds. This indicates that when viewers watch a short film clip that will reveal harmful events, then this triggers a strong anticipatory stress reaction very quickly.

The temporal qualities of suspense section illustrates how film scholars and psychologists have contributed to a framework where the construction of suspense can be measured in terms of a cause-and-effect paradigm, which includes some form of initiating story and outcome event (Brewer & Lichtenstein, 1982; Tan, 1998; de Wied, 1994; Bordwell, 1985).

Conclusion

Based on the review of suspense literature from film scholars and media psychologists, we can propose a broad theoretical definition of cinematic suspense through its core cognitive, emotional and physiological states. We can describe cinematic suspense in a simplistic way as cause-and-effect paradigm (Bordwell, 1985), a mediation process, which elicits an anxiety response as the viewer continuously appraises an initiating story event and following other story events and stimuli that are presented during the construction of suspense (Brewer & Lichtenstein, 1982; Tan, 1998; de Wied, 1994; Bordwell, 1985). With the cause-and-effect process in place, we can now locate three human behaviour levels: cognition, emotion and physiology within the temporal qualities of suspense to illustrate some assumptions of how the viewer experiences cinematic suspense.

The cognitive states involve anticipation and varying levels of uncertainty, and in some cases uncertainty is not present. Anticipation about the nature of future events can also impact the levels of uncertainty. This depends on the type of initiating stimulus, story context and continuous stimuli, during the construction of suspense. Stimuli (narrative elements and cinematic techniques) are presented to the viewer through the syuzhet (the plot) (Bordwell, 1985). The viewer continuously mentally appraises the plot and story world by asking questions about the characters, their goals and challenges in the story world. This invites the viewer to make assumptions and expectations about the story world, creating the fabula (Bordwell, 1985). The viewer then continuously tests their assumptions and expectations throughout the mediation process of cause-and-effect (Bordwell, 1985).

Although suspense is not classified as an emotion, according Sylvia Kreibig, suspense may in the future be classified as a form of anxiety (Kreibig, 2010: 408). This indicates that some form of anxiety is essential for the viewer to experience suspense forming a *phasic* emotion that increases the viewer's interest (Tan, 1998). This informs us that the emotions anxiety (Kreibig, 2010: 408) and interest (Tan, 1998) are essential to suspense. The durability and intensity levels of anxiety will depend on the type of story situation and stimulus. Although film scholars and media scholars often define

suspense in terms of when the protagonist's life is threatened by an antagonist, the viewer can also experience suspense as a direct threat, producing a strong anxiety response (Smith, S. 2000; Hutchings, 2004). This is supported by Nomikos et al. (1968), in that the anticipation of a harmful event increases stress intensity which also occurs when a harmful event looms closer to the viewer (de Wied, 1994). Different emotions are likely to drive the anxiety response during the construction of suspense (mediation process) depending on the story context, such as *tonic* emotion fear (Tan, 1998) or fear acting as a *phasic* emotion that pertains to specific fear stimuli in horror films or excitement in an action thriller (Zillmann, 1996).

When we consider the physiological experience of cinematic suspense, in particular viewer responses to horror films which present harmful events in the story world, they are more likely to create a stronger anxiety response in connection to the emotion fear (Cantor & Oliver, 2004; Zillmann & de Wied, 1996). The fear stimulus presented in a horror film compounds the viewer anxiety response based on the viewers' prior knowledge of watching similar films and scenes (Hoffner & Cantor, 1990) and then imagining what is likely to happen (Norden, 1980). This triggers the brain's defence system in the amygdala, which through a network of neural messages creates changes in our automatic nervous system (ANS) and physiological states (Misslin, 2003), creating goose bumps (piloerection) (Benedek & Kaernbach, 2011) and sweaty palms (Zillmann & de Wied, 1996). Once our fear defence mechanism kicks in, some viewers may react with coping strategies such as avoiding watching the scene (Zillmann, 1996).

This now completes the theoretical definition of cinematic suspense, which operates through three human behaviour levels: cognition, emotion and physiology. This definition of cinematic suspense provides framework for measuring cinematic suspense through a cause-and-effect paradigm. In Chapter 2, the discussion will build on this theoretical definition of suspense and focus on the design of a film experiment to measure cinematic suspense.

CHAPTER 2
Measuring Cinematic Suspense

In response to the limitations within existing definitions of cinematic suspense and in order to more fully interrogate viewers' experiences of suspense as cognitive, emotional and physiological (Young, 2012) this chapter proposes a triangulation mixed methods approach to defining cinematic suspense in horror films. A mixed methods approach was selected because film scholars and media psychologists have not proposed a definition of cinematic suspense that provides a framework to measure suspense using traditional qualitative or quantitative approaches (Friedrichsen, 1996: 329). As explained in chapter one many film scholars and media psychologists have identified the components of cinematic suspense based the cognitive state of uncertainty and the emotions hope and fear (Carroll 1996; Yanal 1996; Zillmann 1996; Ortony et al. 1988), which has led to misconceptions about cinematic suspense. In order to measure cinematic suspense it is essential that the generic components of suspense are clearly defined so that the researcher knows what they are measuring when they attempt to measure suspense (Friedrichsen, 1996: 329-330 & 338).

Therefore to define cinematic suspense we first need to identify the components of cinematic suspense which will lead to designing a framework to measure viewer experience of cinematic suspense. In order to do this demands a new approach to research methods, procedures and techniques to measure cinematic suspense and viewer experience. According to John Creswell researchers recognise that all research methods have limitations and biases. By using a combination of research methods is more likely to address these problems. Creswell highlights the way triangulation as a mixed methods approach provides a strategy for integrating qualitative and quantitative data where one method can add further insights into another method. This has led to researchers developing new innovative methods of data analysis where qualitative data and quantitative data are integrated or combined (Creswell, 2003: 16). Triangulation is a common approach in HCI where datasets are often a mix of complex numerical data and more person-centric qualitative data, and draws on methods from a number of fields allowing the fusion of techniques from both the hard and social sciences. This has especially been the case in studies about viewer/user experience of different types of narrative trajectories from art installations, theme park rides and

video games (Benford et al. 2009). This thesis then takes a HCI approach to an experiment design where triangulation will involve three lines of enquiry that capture and analyse three data sets: film textual analysis, viewer psychophysiological responses and viewer feedback themes and comments. This chapter focuses on selecting the most appropriate methods, techniques and procedures that leads to the measurement of viewer experience of suspense. The methodological approach involves the design of the 'Terror & Tension' film experiment, providing a framework for a psychophysiological model of cinematic suspense for 21st century horror films. As already discussed, film studies scholars have predominantly relied on methods of textual analysis to interrogate the construction of cinematic suspense. Therefore the discussion will start with how media psychologists have attempted to measure viewer experience of cinematic suspense.

The Challenges of Measuring Suspense

Media psychologists measure viewers' experience of suspense within an experimental design setting, by recording viewer personal experiences of suspense using self-reports through interviews, surveys, questionnaires and behavioural measures by capturing viewers' psychophysiological responses to a specific stimulus in a film clip (Zillmann & de Wied, 1996; Mattenklott, 1996). According to Axel Mattenklott self-reports are very effective in understanding viewer experience of what they feel when they experience fear in terms of physiological reactions. Viewers' replies included rapid heartbeats, muscle tension, trembling, sweating and sweating palms (Mattenklott, 1996: 294). However, problems occur when self-reports, interviews and questionnaires are used retrospectively to gain participant feedback after watching a film clip or collection of film clips in an experimental design setting (Zillmann & de Wied, 1996; Mattenklott, 1996; Levenson, 1988). The longer the participant waits to provide feedback, the greater the chances of that feedback being unreliable due to them reflecting on their experience and changing their responses (Levenson, 1988: 38). In addition, Zolf Zillmann argues that participant feedback is unreliable because they may misinterpret their experience to impress the interviewer (Zillmann & de Wied, 1996: 267) or because they cannot articulate their emotional experience (Mattenklott, 1996: 293).

The problem of gaining reliable self-reports has encouraged researchers to use technological processes to capture the viewer's immediate response when reacting to a stimulus. According to Zillmann, some studies have captured viewers' conscious experience of a specific emotion when watching a stimulus by asking them to press a button or key on a PC keyboard (Zillmann & de Wied, 1996: 276). However, this activity disrupts the viewing experience and may alter the viewer's emotional state or act as a distraction and disengage the viewer from the stimulus. To overcome these problems with self-reports in the 'Terror & Tension' experiment, it seemed feasible to investigate behavioural methods that capture a viewer's psychophysiological responses. These were then twinned with viewer self-reports, collected in the form of immediate verbal feedback after they watched a film clip. This not only ensured that viewer reports were not the only source of data, but also that viewer reports gave an instinctive response to what they had seen and heard in the film clip.

In regard to behavioural measures, these cannot be captured through self-reports and are commonly obtained by observation and analysis of facial expressions or by recording a participant's psychophysiological responses when watching suspenseful film clips (Zillmann & de Wied, 1996: 276). The psychophysiological measurements include blood pressure, blood pulse volume, heart rate and skin conductance (Zillmann & de Wied, 1996: 277). Measuring viewer psychophysiological responses to media stimuli was still in its infancy during the 1960s -1980s and, to date, there have been few psychophysiological studies on suspense (Kreibig, 2010: 408). Of those that exist, media psychologists who have used viewer psychophysiological responses to measure suspense, modify extracted film clips from a feature film to create a specific viewer response (Zillmann & de Wied, 1996: 268), which then creates an artificial experience of suspense, one that is designed to fulfil the purpose of the experiment. The results from these experiments tell us little about viewer experiences of suspense based on the original story elements of the film clip and their capacity to elicit suspense without manipulation. The key difference to the 'Terror & Tension' film experiment is that the film clips extracted from feature films are not manipulated, with the original film clip intact and representing a specific story context and narrative structure that can be

measured. According to Mike Friedrichsen without a clear definition of suspense it becomes problematic to measure suspense as he explains:

> At first, this means that suspense-evoking stimulus materials cannot be theoretically classified with absolute accuracy. The second consequence may be more important. Researchers cannot be absolutely sure what they are measuring when they try to measure suspense. As the experience of suspense is a cognitive as well as physiological process, the different indicators of suspense can at least be divided into two groups: physiological and cognitive indicators (Friedrichsen, 1996: 338).

In response to Friedrichsen's suggestions, it was important to develop a theoretical definition of cinematic suspense (see chapter 1) which provides a framework to measure the construction of cinematic suspense in terms of anxiety durability and intensity within a specified story context (e.g. horror films) and narrative structure, which would provide a greater insight in how suspense changes over time (durability) and with levels of intensity.

Building on this theoretical definition of cinematic suspense, the 'Terror & Tension' film experiment offers a new approach to experiment design to gain an in-depth understanding of the viewer's experience of suspense using a mixed method approach, triangulation, which involve three lines of enquiry: firstly, textual analysis of the film clips. Secondly, behavioural measures by recording viewer psychophysiological responses when they watch the film clips that reveal an 'invisible data channel' in how our bodies unconsciously react to suspense. This involves recording viewer psychophysiological responses to measure suspense as a mediation process, in terms of anxiety durability and intensity, which could not be determined through self-reports alone. Thirdly, viewer verbal self-reports to contextualise the participants' personal experience of suspense.

The design of the film experiment involved selecting film clips from horror feature films and measuring viewer responses to four suspense narrative structures using the psychophysiological recording technique electrodermal activity (EDA). Twenty-seven participants had their psychophysiological responses recorded while watching the horror film clip sequences and provided verbal feedback after each film clip to

gain a deeper insight into viewers' experiences. The discussion will include the following key sections: film clip selection and psychophysiology recording.

Film Clip Selection

For the 'Terror & Tension' experiment 32 film clips were selected and extracted from 8 feature horror films. This technique was chosen because short film clips are an essential tool for investigating viewer experiences of suspense, even though the film clip does not have the story context of the feature length film. To film studies scholars, this method of research is problematic because a film clip extracted from a feature film was not made to be viewed in isolation and without the story context of the feature length film. For example, Susan Smith, explains that the build-up of tension is essential for the viewer to experience suspense and that high levels of suspense cannot occur without the story context of what has gone on before in the feature film:

> What may within the normal course of viewing a film generate a high degree of tension, on the basis of knowledge of what has gone before and prior involvement with the character(s) concerned, is likely to produce a much weaker response if watched in isolation. Similarly, a particularly suspenseful scene will inevitably feed into what follows, thereby resulting in a situation of increasing (rather than diminishing) returns. In Hitchcock's case, this cumulative process is often seen to be characterised by a steady build-up of tension (Smith, S. 2000: 26).

Although Smith describes the importance of a viewer's knowledge of what has gone before and their involvement with characters to generating high levels of suspense, she then contradicts this theory by providing an example of a direct form of suspense that occurs during the opening credits of *Psycho* (Alfred Hitchcock, 1960).

> While at its most imminent here, the threat of direct assault is perhaps demonstrated in its purest form right at the beginning of the film, when the opening credits sequence subjects the viewer alone to the violent, stabbing rhythms of both the linear imagery and Herrmann's music (Smith, S. 2000: 24).

Susan Smith states that any form of suspense cannot be generated without prior knowledge of what has gone before in the story, yet her example from *Psycho* provides an example of how a film clip can elicit high levels of suspense without prior knowledge of narrative events or character. Furthermore, viewers who have generic knowledge (Bordwell, 1985: 34) of horror films may help a viewer spot moments of

suspense or fear without specific knowledge of the story context of an individual film's narrative. Smith's assumption also excludes other factors that could encourage the viewer to elicit high levels of suspense when they watch a film clip in isolation during a film experiment, such as the viewer being aware they will be watching film clips from horror films.

Greg Smith argues that the viewer's mood can be determined by their prior knowledge of watching similar films and/or understanding genre conventions, so when they go to watch a horror film this knowledge creates a preparatory state (mood) of fear and feeling anxious and they then seek out story, visual and aural elements of the film that make them feel scared as he explains:

> A fearful mood puts us on emotional alert, and we patrol our environment searching for frightening objects. Once we see a frightful sight, this bolsters the mood and makes it more likely that we will continue evaluate future stimuli as frightening, this giving the fearful mood its inertia…Moods act as the emotion system's equivalent of attention, focusing us on certain stimuli and not others. These expectancies are themselves low-level emotional states that tend to be more diffuse and longer lasting than emotions…A Mood, therefore, is a longer-lasting but less forceful emotion state with an orientating function that encourages us to express a particular group of emotions (Smith, G. 2007: 38).

Following Greg Smith's argument, in regard to the 'Terror & Tension' film experiment, participants had prior knowledge of the type of film experiment (e.g. horror), which meant that viewers were expecting to be scared, even though the experiment uses short film clips watched outside of the story context of the feature film. In the case of using short film clips that include a story context to increase viewer anticipation stress, (Nomikos et al. 1968: 204-206), found that this led to high levels of anxiety during the construction of suspense, which demonstrates that horror film clips extracted from feature length films can elicit a strong form of anxiety response in a film experiment.

We shall now examine in more detail how experimental psychologists develop new theories about emotion using the research method of experimental design and extracting (and editing) short film clips from commercially made feature films to elicit

a specific emotion or a 'blended' emotion, where viewers experience more than one emotion at the same time (Rottenberg, Ray & Gross, 2007). The reason why psychologists use short film clips in their experiments is that when participants watch a feature film the viewer is more likely to experience a wide variety of emotions (Rottenberg et al. 2007). A short clip allows researchers to focus on the specific emotions being studied. Psychologists Jonathan Rottenburg, Rebecca Ray and James Goss have led the field in experiment design using short film clips to elicit emotion (Rottenberg et al. 2007). Over the years they have created an iterative film clip selection process and published guidelines for other psychologists and researchers who wish to use film clips to elicit a specific emotion. Their pioneering work has led to other psychologists and researchers using their library of film clips that elicit specific emotions such as disgust, amusement, and the blended emotion fear, while other researchers such as: Luca Canini, Steve Gilroy, Marc Cavazza, Riccardo Leonardi and Sergio Benni (2010), have created their own film clips using Rottenberg et al. (2007) iterative film clip selection process.

Rottenberg et al. (2007) demonstrate how they found that fear is a blended emotion like suspense. They extracted an 88.0 second long clip from the feature film *Silence of the Lambs* (Jonathan Demme 1991) and edited the clip to specifically elicit the emotion fear. Their results revealed viewers expressing interest and feelings of tension. According to Ed Tan, the emotion interest is linked to tension and is essential to viewer engagement. This means that the emotion fear is nuanced with interest and feelings of tension because the viewer cannot experience these emotions without being engaged in the story of the film. This supports the finding from Rottenberg et al. (2007) that using film to elicit the emotion fear creates a 'blended' emotional response (Rottenberg et al. 2007: 21) that is more pronounced than if viewers watched a still image (representing fear) that has a limited narrative sequence. This is because film clips present a continuous unfolding narrative and fear stimuli, where viewers are more likely to experience a blended emotion compared to a still image that has a static fear stimulus, where the narrative does not change over time.

In the *Silence of the Lambs* example, the blended emotional experience of fear is combined with the interest, which emerges from viewer engaging with the story and their interest in watching a horror film narrative. As mentioned in chapter one interest is a *tonic* emotion (background emotion) that increases in intensity levels when *phasic* emotions such as anxiety (suspense) increase intensity levels of interest (Tan, 1998). When the viewer experiences the emotion fear as a *tonic* emotion (Tan, 1998), they will respond with a high anxiety response because 'fear is a danger avoidance mechanism' (Eitzen, 2010) and anxiety increases when we experience something that might harm us in real life or when we watch something that scares us in a horror film (Zillmann, 1996: 203). The example by Rottenberg et al. (2007) of using an extracted modified film clip from *Silence of the Lambs* to induce the emotion fear, demonstrates the problems psychologists have in controlling the effects of a short film clip to elicit one emotion, especially in the case of fear is created through blend of emotions of interest and an anxiety response to fear stimuli in the film clip.

In regards to the experience of suspense other psychologists have found that suspense (a blended emotion) can be elicited in seconds (Tan, 1998; Nomikos et al. 1968) rather than the traditional notion that suspense can only occur through a slow build-up of tension (Smith, S. 2000: 26). As mentioned in chapter one in the psychophysiological film experiment *Surprise versus Suspense in the Production of Stress Reaction*, (Nomikos et al. 1968) were able to define the timing of suspense as being 18.7-25.7 seconds, which confirms suspense can be measured using short film clips less than 25.7 seconds in duration, even though suspense is a blended emotion. However, there is a distinct difference in film clip extraction techniques between psychologists who manipulate a short film clip to elicit a target (Rottenberg et al. 2007) or blended emotion (Nomikos et al. 1968) and the approach taken in the 'Terror & Tension' film experiment. For example, Rottenburg, Ray and Goss admit their methods of creating a film clip can be problematic, explaining: 'We also have found that even if a film segment survives its surgery, the emotional impact can vary as a result of relatively minor variations in the editing of either the music, the image or both' (Rottenberg et al. 2007: 16). Although psychologists would have greater success in eliciting a specific emotion if they made an original short film clip, such work would require a high level

of skill in scriptwriting, directing, cinematography and editing. The high cost of film production and timeframe, is also not feasible for psychologists (or an experimenter) to create their own short film clip to elicit a specific emotion.

The 'Terror & Tension' experiment took a different approach to elicit suspense by not editing short film clips that were extracted from feature horror films. This is because the aim of the experiment was to measure suspense using specific narrative structures that are assumed by film scholars using textual analysis to elicit suspense in feature films. Manipulating these films clips in any way would have produced inaccurate information about viewer experience of suspense within the story context of the narrative structure. By taking this approach, the horror film clips would need to have sufficient story context to elicit suspense. The results of the experiment will also determine whether micro-film sequences produce different forms of anxiety as a *phasic* emotion (see chapter 1) in terms of durability and intensity rather than the duration of each narrative structure. Susan Smith's model of suspense offered the best framework for selecting the film clips as she is the only film scholar that has proposed different narrative forms of suspense based on her textual analysis of Alfred Hitchcock's films (Smith, S. 2000).

Although Susan Smith's model will be discussed in detail in chapter four, for now I will explain the core definitions of the three types of suspense narrative structures that form Smith's model of suspense: vicarious, shared and direct (Smith, S. 2000: 18-25). Vicarious suspense is based on Alfred Hitchcock's prototype of suspense (Hitchcock cited in Truffaut, 1985: 73) and occurs when the viewer is privileged with crucial narrative information about a fictional character's (usually the protagonist) situation that is denied to the character (Smith, S. 2000: 19). Shared suspense is when both the viewer and protagonist are aware that the protagonist's life is in danger and the viewer empathises for their safety. Direct suspense is very different to vicarious and shared suspense. As Susan Smith explains, direct suspense is essentially where the viewer experiences suspense alone rather than through an emotional bond with a protagonist, which is often used in horror films as a direct threat to the viewer. For Smith, the purest form of direct suspense is when the point-of view (POV) camera shot is seen in the

first person and the viewer experiences suspense directly (Smith, S. 2000: 25). Susan Smith also explains that a composite form of suspense is created when two or all three suspense narrative structures (vicarious, direct and shared) work side by side during a film. Such a situation, she argues is likely to produce an intense form of suspense (Smith, S. 2000: 22).

For the 'Terror & Tension' experiment, Susan Smith's suspense narrative model resolves three important issues: firstly, it provides a story context within each film clip that is assumed will elicit suspense. Secondly, each film clip's duration is dictated by the narrative structure in any given film sequence or film. Thirdly, the film clip can be extracted from the feature film so that the film clip is limited to the construction of suspense, ending moments before the outcome event and the resolution to the suspense. Each suspense narrative structure (vicarious, direct and shared) has its own story context within a film sequence, in particular how the viewer is positioned in relation to the fictional characters in the story world or when there are no fictional characters present in the frame (direct suspense). The duration for each film clip is determined by the story elements that construct suspense rather than the arbitrary 1.0-3.0 minutes recommended by (Rottenberg et al. 2007: 15). Therefore, measuring viewer anxiety responses to vicarious, direct, shared and composite suspense offers a new paradigm for experimental design in defining viewer experience of cinematic suspense.

Why Horror Film Clips?

Taking on board the comments made by Mike Friedrichsen that film sequences which are deemed to elicit suspense 'cannot be classified with absolute accuracy' (Friedrichsen, 1996: 338), it was important that a genre/story context was selected that could be assumed that it would elicit as strong anxiety response. Therefore the decision was to use horror film clips for the 'Terror & Tension' film experiment as it was expected they would elicit a strong anxiety response during the construction of suspense. This would link the emotion fear (*tonic* & *phasic* emotion) with anxiety (*phasic* emotion) to elicit a strong form of suspense (Zillmann, 1996: 203). This is supported by Ed Tan who describes our experience of fear when watching a horrific

scene as an empathetic fear response (Tan, 1998). First, we can hypothesise that being presented with a serious threat, such as a fear stimulus in the context of a short horror film clip, will produce variations in viewers' anxiety response, measured in terms of durability and intensity. By defining anxiety durability of an anxiety response and intensity by different levels means that durability and intensity offer two variables to measure the impact of fear stimuli in horror film clips. This would lead to discovering a more nuanced insight into viewers' experiences of suspense when watching horror films.

The decision to select horror film clips was reinforced via a pilot study. For this pilot study, 8 film clips were selected based on a mixture of thriller-horror films and an additional film clip to represent a neutral stimulus (a documentary film about the ocean). In the pilot study each feature film was represented by one film clip, which contained more than one of the suspense narrative structures (vicarious, direct or shared) from Susan Smith's model. The pilot study demonstrated that zombie horror film *Quarantine* (John R Dowdle, 2008), had the strongest response from viewers based on their skin conductance responses (electrodermal activity) and viewer feedback results, whereas *The Birds* (Alfred Hitchcock, 1963) produced a much weaker viewer response. Therefore, based on literature from media psychologists and the pilot study, the 'Terror & Tension' experiment consisted of films clips from 8 horror films, with each clip depicting fear stimuli to increase viewer anxiety in terms of durability and levels of intensity.

Defining Cinematic Suspense Emotions in Horror Films

To select the most appropriate horror films for the 'Terror & Tension' experiment, I had to establish what other emotions are nuanced with suspense in horror films. In order to do this I created a theoretical definition of cinematic suspense for horror films based on the literature from film studies, psychology and psychophysiology as discussed earlier in this chapter and in chapter one. As mentioned previously regardless of film genre the emotion interest operates as background *tonic* emotion which increases in levels of intensity when a viewer experiences suspense (Tan, 1998). In horror films the emotion fear is another *tonic* emotion that is nuanced with suspense

but is different to the emotion interest because the fear drives viewer anxieties for the type of cinematic suspense experienced in horror films. Fear as an emotion operates in two ways, first as a *tonic* emotion by maintaining the viewer's mood of feeling frightened (Smith, G. 2007) and secondly, *fear* as a phasic emotion to ensure a fear stimulus elicits a strong form of anxiety, a *phasic* emotion (Tan, 1998) during the mediation process of the construction of suspense. With fear playing a dominant and active role, fear was selected as the driving emotion of cinematic suspense in horror films and anxiety as the viewer response.

Apart from interest, fear and anxiety being the emotional components of suspense in horror films I also had to identify whether any other emotions maybe present when viewers watch horror film clips. For example, horror films often elicit the emotion disgust, which is very different to suspense, in response to, for instance, a character vomiting or being brutally murdered during an explicitly gory sequence. However, the emotion disgust can also be used to elicit an intense form of suspense rather than detracting from suspense. To elaborate further, a fear stimulus that necessitates the viewer seeing a gory sequence, will elicit an intense form of suspense because of their fear of watching something gory. Another emotion that is commonly experienced when watching a horror film is surprise, which produces a sudden scare moment, for example, through an unexpected narrative event such as, a frightening antagonist who suddenly appears on screen looking directly at the viewer.

Alfred Hitchcock describes surprise and suspense as complete opposites, with a surprise narrative event occurring unexpectedly as a sudden shock (Hitchcock cited in Truffaut, 1985: 73). This is in contrast to how suspense builds-up tension over time often through a conflict between a protagonist and antagonist. Hitchcock's assumption of surprise and suspense being opposites is not always valid, because a surprise narrative event can also elicit suspense. For example, in the horror film *The Descent* (Neil Marshall, 2005), a group of women embark on a cave expedition and become trapped inside the cave with a group of zombie predators and the women become separated. In one particular sequence, a woman is shown walking through the caves with no signs of immediate danger. Suddenly a zombie appears from the ceiling of the

cave and launches an attack on her. Although the zombie attack surprises the woman, she manages to escape from the zombie by running through the dark caves. This scene elicits suspense by increasing viewer's anxieties about whether the zombie will catch her and launch another attack as she is chased. The surprise story event could also occur to heighten suspense presented as an outcome event of a previous suspense sequence.

Surprise can also create a twist in the plot (Hitchcock in Truffaut, 1985: 72), which can elicit suspense and change a viewer's perception of future narrative events in the story. Therefore, surprise can be used as narrative device to trigger the construction of suspense especially in horror films, where filmmakers seek to unsettle the viewer by initiating a sudden fear stimulus, increasing viewers' anxieties. In the 'Terror & Tension' experiment, a surprise narrative event in the form of a fear stimulus was presented in 20 of the 32 film clips, although these had limited success in eliciting suspense, which is explained in more detail in chapter 3, 4 and 5. The emotion disgust was limited in the film clip selection to, for example, showing a zombie's physical appearance because of the antagonist role in eliciting suspense when they threaten the life of a protagonist. However, bloody and grisly deaths were eliminated from the film clips, because the emotion disgust could have become the dominant emotion expressed by viewers rather than anxiety. The discussion will now turn to the selection of horror feature films based on when the films were made and by whom, to horror subgenres and thematic content that can assist comparison analysis of film clips.

Horror Film Selection

Film clips selected for the 'Terror & Tension' film experiment were based on Susan Smith's suspense narrative model because her model contains different forms of suspense (vicarious, direct and shared), based on how the viewer is positioned with fictional characters in the story world. When adding a composite form of suspense, a combination of vicarious, direct or shared suspense provides four different ways to measure suspense narrative structure across different horror films. It is important that the type and style of feature films selected for the film experiment are watched by large audiences. For example, art based films do not always follow the narrative

conventions of Western popular Hollywood films and are watched by smaller audiences in 'art theatres' (Bordwell, 1985: 205). Therefore, Hollywood studio films were selected for the 'Terror & Tension' experiment because these films are watched by the largest audiences worldwide and have a distinctive style in terms of narrative structure (Bordwell, 1985). They also utilise the suspense narrative structures from Susan Smith's model of suspense.

A decision was made to select post-2000 horror films that incorporated modern digital filmmaking techniques, such as computer graphics imagery (CGI), which makes visual effects appear more realistic than many traditional horror films made earlier. CGI plays an important role in modern day horror films so that monsters or supernatural events look more lifelike. In addition, more modern movies were selected because viewers who enjoyed watching a film made many years ago are more likely to have watched the same film repeatedly, which increases the chance of habituation. This occurs when the viewer becomes very familiar with a specific fear stimulus (Boucsein, Fowles, Grimnes et al. 2012) on repeat viewing and is less frightening and suspenseful.

With the horror genre consisting of many different story worlds, it seemed pragmatic to select a small group of popular sub-genres: Supernatural, Zombie, Home Invasion and Science Fiction. In recent years these horror sub-genres have been successful in building film franchises, such as Supernatural: *Paranormal Activity* (Oren Peli, 2007), Zombie: *Resident Evil* (Paul Anderson, 2002), Home Invasion: *The Purge* (James DeMonaco, 2013) and Science-Fiction: *Alien* (1979) – *Prometheus* (Ridely Scott, 2012). Each subgenre was represented by two horror films, so that direct comparisons could be made between different horror films from the same subgenre and narrative structures: vicarious, direct, shared and composite. The reason for this decision is that according the (Rottenberg et al. 2007), it is very difficult to make comparisons between different film clips due to their unique signature such as: duration, intensity, story context, cinematic techniques (composition, editing, lighting, colour, sound, set design) and characters. Although they did not include narrative structure in their analysis, they did discover three other key elements where a comparison between two

film clips could be made: duration, intensity and thematic content (Rottenberg et al. 2007:14).

For the 'Terror & Tension' experiment I focused on narrative structure (vicarious, direct, shared and composite), which determined the story context and duration of the film clip and thematic comparison through two themes and one cinematic technique. With the experiment measuring suspense as an anxiety response it was important that the selected themes and cinematic technique are more likely to produce a strong form of anxiety. The first theme presents a fear stimulus in the form of a harmful event that will threaten the protagonists life (de Wied, 1994). For example media psychologists have found that viewers are more likely to experience a stronger anxiety response when the protagonist has a slim chance of survival against an antagonist (Comisky & Bryant, 1982) and when a fear stimulus is looming closer to the protagonist (de Wied, 1994) or directly at the viewer (Smith, S. 2000; Hutchings, 2004).

The second theme involves the protagonist being isolated, trapped (or both) within an open space or building and cannot escape from any situations that threaten their life (Zillmann, 1996: 202-203). The cinematic technique used was lighting, so that the viewer watched the film clip in complete darkness or low-key lighting, which is commonly used in horror films to create dark shadows (Barsam, 2007; Kydd, 2011). This elicits suspense by concealing or delaying narrative information from the viewer and fictional characters (Bordwell, 1985). The viewer may also experience a stronger anxiety response more directly when a scene that is presented in the dark, combined with an unexpected sound or dramatic music (Hutchings, 2004), because the dark triggers our primordial sense of fear and vulnerability to what is hidden, unknown and possibly life threatening (Eitzen, 2010).

The film selection process to find eight horror films for the 'Terror & Tension' experiment involved two stages. The first was to identify potential horror films for the four sub-genres (supernatural, zombie, home invasion and science fiction) and thematic and cinematic criteria (protagonist and harmful event, protagonist being trapped, isolated or both and low-key lighting – the dark). The second stage was to

match the film sequences with the suspense narrative structures (vicarious, direct, shared and composite). The first stage was achieved by searching for horror films using the online Internet Movie Database (IMDb). IMDb provides quick access to films by genre, plot, actors and movie trailers and quickly enabled an estimated match with the three selected themes. Selecting the horror films for the 'Terror & Tension' experiment was made easier because of the previous search made for the pilot study, which involved selecting horror films such as *Quarantine* (zombie) and *Paranormal Activity* (supernatural). By combining the previous search for the pilot study, combined with my own previous viewing experience of horror films in recent years, reduced time in selecting a shortlist of 18 films horror films for further investigation (Figure 2.1).

Film	Duration (mins)	Sub-genre	Director	Year	Classification
Grave Encounters 2	95	Supernatural	John Poliquin	2012	18
Pitch Black	109	Science Fiction	David Twohy	2000	15
The Descent	99	Zombie	Neil Marshall	2005	18
Silent House	86	Home Invasion	Chris Kentis, Laura Lau	2011	15
The Strangers	86	Home Invasion	Bryan Bertino	2008	15
Sinister	110	Supernatural	Scott Derrickson	2012	15
Quarantine	89	Zombie	John Erick Dowdle	2008	18
Cloverfield	85	Science-Fiction	Matt Reeves	2008	15
Pandorum	108	Science-Fiction	Christian Alvart	2009	15
The Ring 2	110	Supernatural	Hideo Nakata	2005	15
Insidious	103	Supernatural	James Wan	2010	15
War of the Worlds	116	Science-Fiction	Steven Spielberg	2005	12A
Constantine	121	Supernatural	Francis Lawrence	2005	15
White Noise The Light	99	Supernatural	Patrick Lussier	2005	15
Predators	107	Science-Fiction	Nimród Antal	2010	15
The Collector	90	Home Invasion	Marcus Dunstan	2009	18
The Purge	85	Home Invasion	James DeMonaco	2013	15
Prometheus	124	Science-Fiction	Ridley Scott	2012	15

Figure 2.1. A table showing the short-list of 18 horror films and the 8 films selected for the 'Terror & Tension' experiment (highlighted in yellow).

The second stage was to view all 18 films to ascertain which feature-length films conformed to the four sub-genres, three themes and contained all suspense narrative structures (vicarious, direct, shared and composite. The eight films that were selected for the 'Terror & Tension' experiment were: *Grave Encounters 2, Sinister* (supernatural); *The Descent, Quarantine* (zombie); *The Strangers, Silent House* (home

invasion); *Pitch Black, Cloverfield* (science – fiction). The duration of the film clips was defined by the suspense narrative structures and were between 1.0-89.0 seconds with only 12.5% (4 of the 32 film clips) being 60.0 seconds or longer. This informs us that suspense narrative structures can work within a much shorter time frame than the arbitrary duration to elicit a target emotion of 1.0-3.0 minutes that is recommended by Rottenberg et al. (2007).

Experiment Design

Once the film clips had been selected it was important to identify potential bias through prior viewing of the films. Identifying prior viewing experience is essential because viewers will react differently to seeing a film for the first time compared to someone who has already seen the film previously (Rottenberg et al. 2007). In order to gain participant prior viewing experience, a questionnaire was designed with a list of forty horror-thriller films that included the eight horror films selected for the film experiment. The questionnaire was the first task that all participants completed when they attended the 'Terror & Tension' experiment and enabled me to identify how many participants had previously watched the films in the experiment, so the information could be used in the analysis of the results from the experiment (see chapter 3).

Another factor that can influence viewer responses to a film clip is when the viewer watches film clips in succession during the experiment. This is because a film clip will carry over its effects into the following film clip and contaminate viewers' responses to the following film clip (Goodwin, J & Goodwin, K. 2014; Rottenberg et al. 2007). Two techniques were used to significantly reduce carry over effects from a previous film clip. First, I implemented recommendations from psychologists James and Kerri Goodwin, to create a set of unique film clip sequences for the 32 film clips, so that each participant would watch the film clips in a different order (Goodwin, J & Goodwin, K. 2014). In order to do this partial counterbalancing was used, which involves providing each film clip (within its own suspense narrative structure) a designated number of 1-8 and then randomising the numbers (Goodwin, J & Goodwin, K. 2014: 188). This ensured that participants watched the film clips in a different order, reducing carry over effects (Goodwin, J & Goodwin, K. 2014: 184).

The film sequences were then randomised to define the order of the film clips for each participant, based on each narrative structure rather than creating a film clips order sequence consisting of all 32 film clips. The reason for this decision is that creating a film clip order sequence based on all 32 film clips would mix up the film clips from each narrative structure and decrease the chance of viewers' stronger carry over effects by them watching back-to-back film clips from the same film. However, the order sequence for the narrative structures was the same for all participants, with the decision being based on the duration of each narrative structure: Vicarious (92.0 seconds), direct (164.0 seconds), shared (350.0 seconds) and composite (490.0 seconds). The reason why vicarious suspense narrative was selected to be shown first in the experiment was to avoid the carry over effects from showing the longer narrative film sequences for direct, shared and composite first. For example, film clip durations in each narrative structure had different lengths, *Silent House*: vicarious suspense (8.0 seconds), direct (37.0 seconds), shared (59.0 seconds) and composite 89.0 seconds. Showing either direct, shared or composite suspense before vicarious suspense would create a stronger carry over effect when viewers watch vicarious suspense, because more story information about the film has been revealed to the viewer before they watch the vicarious shorter film clip.

The second technique to reduce carry over effects was to have a gap between each film clip so that the viewer had a short rest period. This gap was also used to divert viewers' attention towards another task, namely them providing feedback about the film clip they had just watched. Although this technique is recommended by Rottenberg et al. (2007), in their experiments they use a questionnaire as a tool to provide feedback (self-report), whereas in the 'Terror & Tension' experiment viewers provided verbal feedback which was immediate and instinctive. The reason why a questionnaire for viewer feedback was not used, as suggested by Rottenberg et al. (2007) is because using self-report questionnaires depend on the speed it takes the viewer to complete the questionnaire. The longer they take increases the chances they become more susceptible to provide an incorrect statement about their experience (Levenson, 1988: 38). In the 'Terror & Tension' experiment, viewers were immediately prompted for their feedback once a film clip had finished. The prompt

came in the form of a visual message instructing them that they had 30.0 seconds to 'describe what stood out most about the film clip' and if they had time 'say what you saw, heard and felt about the film clip'. After 30.0 seconds the visual message on screen would change to an audio-visual message 'Stop talking the next film clip is about to start', to ensure viewers would direct their attention to preparation for the next film clip. The audio-visual message would fade out after 5.0 seconds and the viewer would watch a black screen for a further 5.0 seconds before the next film clip started.

Testing the Film Sequence

With the length of the film experiment being 38.0 minutes' duration and the possibility that viewer fatigue could influence the effects of the longer film clips shown later in the experiment, I decided to do a test run with two volunteers. My initial observations discovered that viewers found it difficult in providing immediate verbal feedback after watching a short film clip and in both test cases viewers did not get used to providing feedback until they had watched 3-4 film clips of the 32 film sequence. This problem was rectified for the 'Terror & Tension' experiment by designing a practice session for viewers which involved them watching a pre-film experiment that comprised of two film clips (not included in the film experiment). This was followed by the visual message requesting their verbal feedback about the film clip they had just watched and by the audio-visual message telling them to stop talking and to prepare for the next film clip. After completing the prior-viewing questionnaire (thriller-horror films) in the 'Terror & Tension' experiment all viewers first took part in the film clip viewing practice session, which enabled viewers to watch the two film clips repeatedly until they felt confident in providing verbal feedback about them.

The next stage of the 'Terror & Tension' experiment testing was identifying whether participants would experience fatigue due to the film experiment being 38 minutes long. Both viewers who took part in the testing phase suggested that they thought a break in the middle of the film experiment would be beneficial. This led to the editing of the 32 film clip sequence for all participants to add in a 2.0 minute gap between the second (direct) and third (shared) narrative structure so viewers could have a break

while waiting from the next film clip to start. After the two minute break an audio-visual message 'the next film clip is about to start' was announced to give viewers 10.0 seconds before the next film clip was shown. Another issue that could have caused a problem was habituation, which occurs when viewers watch the longer film clips (shared and composite) especially towards the end of the experiment. Habituation is a natural phenomenon where a participant response to a fear stimulus declines over time because they get used to the same or similar stimulus (Stern, Ray & Quigley, 2001; 54-55). Although, before the film experiment, it was expected that habituation would occur during the later stages of the film experiment there was no evidence to suggest this had happened (this will be discussed further in chapter 3). The discussion will now turn to psychophysiological recording, which was used to measure viewer responses to fear stimuli in the horror film clips that were used in the 'Terror & Tension' study.

PSYCHOPHYSIOLOGICAL RECORDING

Human Computer Interaction (HCI) often design experiment that use psychophysiological recording techniques to measure participants' physiological responses to specific stimuli in a wide range of user and viewing experiences (Benford et al. 2009). Psychophysiology determines the relationship between physiological and psychological/behavioural variables (Stern et al. 2001: 3-4), For example, the aim of the 'Terror & Tension' experiment was to understand viewer physiological responses to different fear stimuli presented in 32 horror film clips which are expressed through psychological/behavioural outputs, such as feelings of anxiety. This was achieved by using a psychophysiological recording technique that is most appropriate to measure viewers' physiological responses that determine their anxiety response to fear stimuli presented in the horror film clips. The findings from the 'Terror & Tension' film experiment offer film studies a new paradigm in viewer experience of suspense and film analysis. Furthermore, film studies have ignored this area of research, even though film scholars know that viewers experience different physiological reactions when watching a film, such as goose bumps, shivers down their spine and sweaty palms. For instance, film theorist Barry Grant argues that films elicits physiological states in the viewers when they watch suspenseful action scenes (Grant, 2012: 133).

In contrast, media psychologists have measured some aspects of suspense by recording viewer psychophysiological responses when watching modified film clips (Zillmann & de Wied, 1996: 276-277) by recording skin temperature, facial expressions (Hoffner & Cantor, 1990), cardiovascular, respiratory and electrodermal activity (Kreibig, 2010).

To ensure that the psychophysiological recording technique that would produce the most reliable results was used for the 'Terror & Tension' study, I will now provide a short review of the most popular techniques that have been used to measure a fear stimulus or suspense using film clips. This will be followed by a discussion about the autonomic nervous system (ANS) and its two branches, the sympathetic and parasympathetic nervous systems. The physiology of fear will then define the most suitable psychophysiological recording technique to record a fear stimulus in the horror film clips in terms of cost, practicality and accuracy.

Psychophysiological Recording Techniques

There are many different psychophysiological recording techniques that have a long history going back to the 19th century. These established techniques measure specific physiological signatures of muscles, skin, respiratory function, cardiovascular performance and brain activity (Stern et al. 2001). In all cases, electrodes are attached to the skin at specific areas of the body to detect physiological changes. For example, electromyography is a method to measure muscle activity by the detection of developing tension in a muscle and can be used to measure muscle activity all over the body. Electrodermal activity measures changes in the electricity of the skin through emotional sweating, while respiratory measures the rates and depth of breathing. Electrocardiography is a cardiovascular measurement that detects electrical activity of the heart – heart rate activity. Electroencephalography (EEG) records electrical activity of the brain, which has four defined brain wave patterns: Alpha activity (8-12 Hz), which occurs when we are relaxed; Beta activity (18-30Hz) when we are alert; Delta activity (0.5-4Hz) occurs when we are asleep and Theta activity (5-7Hz), which is associated with low levels of alertness, rapid eye movement, sleep and hypnosis (Stern et al. 2001).

In contrast, a non-psychophysiological technique that is well-established in measuring basic emotions is the Facial Action Coding System (FACS), which was pioneered by Paul Ekman in the 1970's. Ekman produced a taxonomy of facial muscular movements that are related to happiness, sadness, anger, fear, surprise, disgust and interest (Friedman, 2010). This technique relies on a visual representation of facial expressions and, although digital technology has dramatically improved techniques to align facial expressions to specific emotional states, the process does not capture measurable data for 'blended' emotions or levels of intensity. This technique is, therefore, problematic when identifying a 'blended' emotion like suspense, where the viewer will experience the emotions of interest and anxiety and at different levels of intensity.

Digital technology has transformed all established psychophysiological recording equipment by improving data accuracy from paper recording to digital recording. These technological innovations have created greater accuracy of recording and produced new types of psychophysiological recording equipment. For example, functional magnetic resonance imaging (fMRI) has been used in scientific research since the turn of the century in providing insights into how the brain functions. FMRI uses powerful magnets to scan the brain to detect blood oxygen level-dependent (BOLD) responses in the brain, which can display on a computer screen parts of the brain that are active when a viewer watches a specific stimulus in a film at a specific moment in time (Hasson, Landesman, Knappmeyer et al. 2008). Although this psychophysiological technique is widely used in neuroscientific studies, the high cost of MRI scanning equipment and operating costs forms a barrier to most researchers who wish to use fMRI in their psychophysiological experiments. There have also been criticisms about the reliability of data. For example, when carrying out a study the participant has to lie down inside the MRI scanner and because the participant's head is in contact with a surface this could reduce specific neural responses in the brain and produce data errors (Jacob, Shear, Norris et al. 2015: 2). Participants have also reported feelings of anxiousness or fear when lying down inside the MRI scanner and the noise associated with the operation of large magnets during the brain scanning

process can induce negative emotions such as anger, fear and depression (Jacob et al., 2015: 2).

Modern technology is also producing more cost effective ways of measuring brain activity with the emerging functional near-infrared spectroscopy (FNIRS), which measures brain activity using a near infrared light (NIR) source. NIR can penetrate skin and bone when within a spectral range of 650-950 nm. Brain activity is detected by relative changes in haemoglobin (Hb) and deoxygenated-haemoglobin (deoxy-Hb) of the blood, which are strong absorbers of NIR (Tak, Kempny, Friston et al. 2015). Although FNIRS has advantages over fMRI, with it being conducted by a lightweight portable device that is significantly cheaper, it cannot measure neural activity in the deep structures of the brain such as the amygdala.

A more radical approach to psychophysiology recording is demonstrated in the study Cinema Data Mining: The Smell of Fear (Wicker, Krauter, Derstoff et al. 2015), which focuses on the exhalation of Volatile Organic Compounds (VOCs) when viewers are responding to a fear stimulus. The study detects VOC concentration in the atmosphere from the skin or when viewers breathe and relate this data to a person's emotional state, in this instance fear (Wicker et al., 2015). FNIR and new biometric measurements such as VOCs, provide alternative techniques to traditional psychophysiological techniques, which all produce movement artefacts and contaminate physiological data sets. That said, further research and studies of FNIR and VOCs are required to establish these techniques and to authenticate their methods.

In order to justify the approach taken in the 'Terror and Tension' experiment, the discussion will now turn to a recent independent review of psychophysiological recording studies by Syliva Kreibig (2010), which includes research papers about fear, anxiety and suspense. Kreibig reviewed 134 psychophysiological studies to determine a link between the autonomic nervous system (ANS) activity and positive-negative emotions, with positive emotions being: happiness, joy, pride and relief and negative: anger, anxiety, disgust, embarrassment, fear, sadness. The studies used psychophysiological recording techniques that measured 33 different cardiovascular

measures, 22 respiratory measures and 6 electrodermal measures (Kreibig, 2010: 402). However, defining emotions using ANS activity alone is complex because the ANS is represented by two sub-nervous systems: the sympathetic nervous system (SNS) and parasympathetic nervous system (PNS).

Although both act together in regulating the biological body balance, called homeostasis (Stern et al. 2001: 60), these two sub-nervous systems are opposite forces that activate different bodily functions when we experience a target or blended emotion. For example, there is a significant body of scientific evidence that demonstrates that the sympathetic nervous system (SNS) is activated by a mental (imagining or thinking about a threat) (Nomikos et al. 1968: 204) or physical threat. This triggers the fight-flight body defence system, which galvanises the body's resources to respond appropriately to the threat (Misslin, 2003). This demonstrates sympathetic neural activity is activated when viewers watch a fear stimulus in a horror film clip and potentially provides an accurate way of measuring viewer experience of suspense elicited through a fear response.

On the other hand, most psychophysiological recording techniques also capture PNS activity, which acts to decrease anxiety and stress levels (Stern et al. 2001). Worse still, this complex relationship between the SNS and PNS does not always function in synchronicity as an interchangeable process. This means that the SNS activity may increase or decrease without changes in PNS or vice versa, while the PNS or SNS activity may increase and the other decreases at the same time (Stern et al. 2001). Therefore, to avoid data contamination from the PNS when measuring a fear stimulus from a horror film, the psychophysiological recording technique selected must exclusively measure SNS. This rules out cardiovascular and respiratory measures because they are controlled by both SNS and PNS activity. Consequently, electrodermal activity (electrical changes in the skin) is the only reliable method to measure changes in SNS activity, because the skin is the only body organ that exclusively measures sympathetic neural activity (Braithwaite, Watson & Jones, 2013).

Furthermore, we can track the fear process from neural messages of the brain to electrodermal activity. Psychologist René Misslin explains that when we experience a fear stimulus, the brain's fear response centre (amygdala) in the limbic system of the brain instinctively mobilises the SNS and fight-flight body defence system (Misslin, 2003). Through a neural network consisting of the hypothalamus, brain stem, sympathetic nervous system and eccrine sweat glands, electrical changes are produced in the skin (electrodermal activity) (Knight, Nguyen & Bandettini, 2005: 1194). In addition, according to Sylvie Kreibig, the threat of something shocking which is experienced when watching horror films elicits the anticipatory component of anxiety (Kreibig, 2010: 403) when a harmful event is presented in the story world (de Wied, 1994). Kreibig goes on to say that 'anxiety has been almost unanimously characterized by sympathetic activation' (Kreibig, 2010: 403). This means that electrodermal activity (EDA) is the most appropriate psychophysiological recording technique to measure viewers' anxiety response to fear stimuli in horror films. The discussion will now turn to EDA, which was used in the 'Terror & Tension' experiment to measure viewers' physiological responses when they watched the 32 film clip sequence.

The Origins of Electrodermal Activity

Electrodermal activity (EDA) research has a long history going back to early physiological experiments in 1849, with French neurologist Charles Feré in 1888 and Russian physiologist Hermann Tarchanoff in 1889 being credited with the discovery of EDA. Feré discovered that passing a small electrical current/voltage across two electrodes attached to the surface of the skin of a participant produced electrical changes when external stimuli was presented to them. This method of measuring electrical activity is called exosomatic, which is widely used today by psychologists as the measurement of skin conductance, a component of EDA (Stern et al. 2001; Boucsein, 2012). In 1889, Hermann Tarchanoff was the first person to use another method of EDA called endosomatic, which measures the electrical activity of the skin without any external current being used, detecting skin potential responses (SPR's). Therefore, the difference between exosomatic and endosomatic techniques is that exosomatic applies a small electrical current/voltage across two electrodes that are attached to the skin, whereas endosomatic technique does not apply an electrical

current/voltage. However, due to the complexity of interpreting the amplitude of SPR's, endosomatic measurement is rarely used in psychophysiological studies (Stern et al. 2001; Boucsein, 2012). Based on these historical findings and the fact that psychologists predominantly use the exosomatic method to measure skin conductance (Boucsein, 2012), the exosomatic method was selected for the 'Terror & Tension' experiment.

The Physiology of Electrodermal Activity

The skin (integumentary system) is the largest organ in the human body (Powell, 2006). The skin is covered with sensory receptors (Stern et al. 2001), which coordinate our sense of touch (machanoreceptors), pain (nociceptors), and temperature (thermoreceptors) (Boucsein, 2012: 8) and is the first line of defence against damage to the body, viruses, bacteria and ultraviolet light (Moncada & Cruz, 2011; Powell, 2006; Stern et al. 2001). Through a network of neurons (nerve cells) the skin constantly receives electrochemical messages from the brain producing measurable electrical changes in the skin, with the primary function of the skin to regulate body temperature and water balance through a thermoregulatory response controlled by the eccrine sweat glands (Dawson, Schell & Filion, 2009).

According to Dawson et al. (2009), the eccrine sweat gland mechanism has a secretory base, a tube wrapped into an uneven coil, with the sweat duct projecting vertically to towards surface of the skin and in the epidermis (skin), the duct spirals vertically in a helix before ending at the skin pore (Boucsein, 2012: 13). The eccrine sweat glands are 'wired' together in parallel and work collectively as variable resistors so when they are stimulated by sympathetic neural activation, sweat is produced and rises up the sweat duct tube towards the surface of the skin, which results in sweating (Stern et al. 2001; Boucsein, 2012). Detectable levels of electrodermal activity depend on how many eccrine glands are mobilised at the same time by sympathetic neural activity, combined with how high the sweat rises in each sweat duct (Dawson et al. 2009). The eccrine sweat glands are dispersed all over the body with a higher gland density on the palmer (hand) and planter (foot) areas of the body which produce emotional sweating through the elicitation of psychological and emotional states (e.g. under stress)

(Boucsein, 2012: 31). Therefore, the eccrine glands located on the hands and feet tend to respond to psychological stimuli rather than thermoregulation (Dawson et al. 2009). According to Payne et al, in a comparison study measuring the EDA differences between the distal phalanges of the fingers of the non-dominant hand and the abductor hallucis muscle (an area of inside of the foot), they discovered that the distal fingers were more responsive than the feet (Payne, Dawson, Schell et al. 2013:1). Further studies confirm that the eccrine sweat glands located in the medial and distal phalanges of the index and middle fingers (Figure 2.2) are significantly responsive (Boucsein, 2012: 104-106) due to a higher density of sweat glands producing emotional sweating (psychological & emotion states). This further demonstrates that EDA is the most suitable psychophysiological recording technique to measure viewers' psychological/behavioural traits such as stress response (Boucsein, 2012: 382) to watching a threatening stimulus (Braithwaite et al. 2013 :6) in horror film clips.

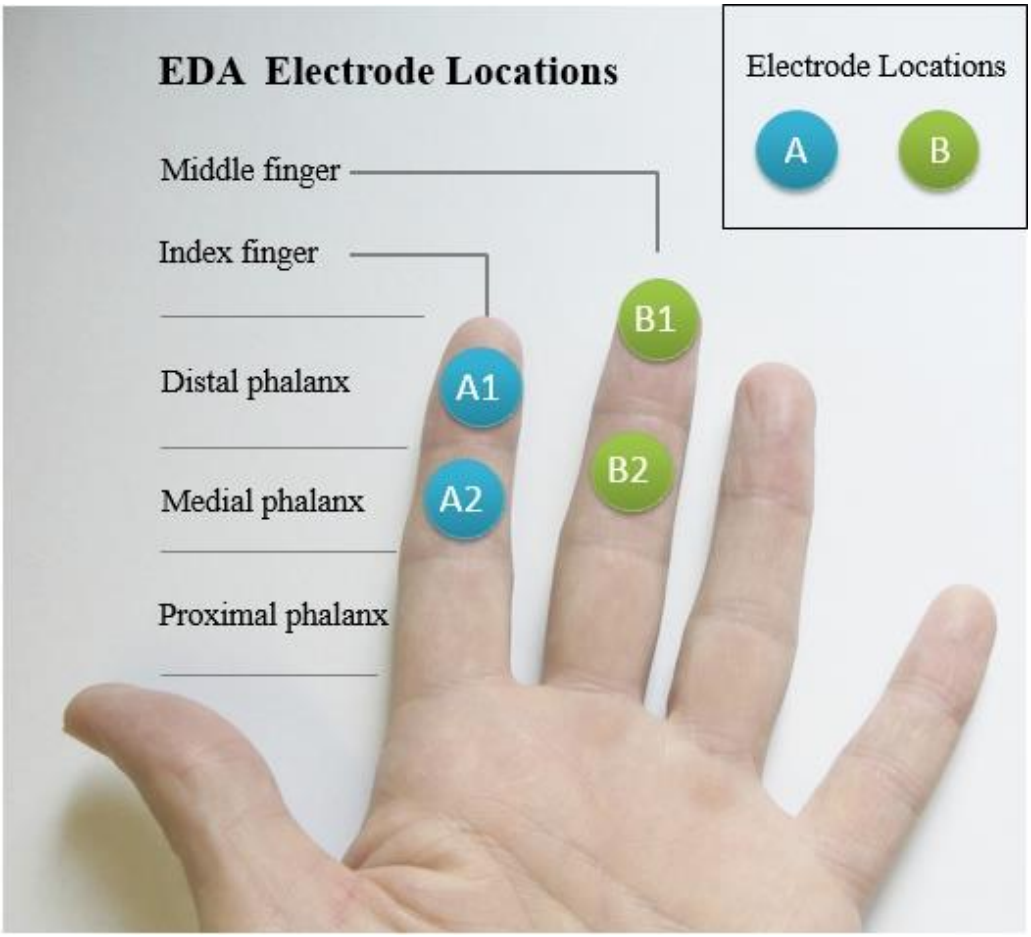


Figure 2.2. The locations for the two electrodes (A1-B1; Distal phalanx) or (A2-B2; medial phalanx).

EDA Components

To record a direct skin conductance response in the 'Terror & Tension' experiment I adopted the exosomatic EDA method to record two main EDA components of skin conductance:

1). *Tonic* skin conductance level (SCL), which is best described as a broad background measurement of skin conductance that produces slow changes in amplitude over time and cannot be identified to a specific internal (imagined) or external stimuli (watching a film) (Boucsein, 2012).

2). *Phasic* skin conductance responses (SCR's), punctuate SCL with rapid short abrupt increases in SCL amplitude, which are created when participants respond unconsciously, cognitively or emotionally to a specified internal (imagined) or external stimuli (watching a film) (Boucsein, 2012).

Although psychology have not made a connection between *tonic* emotions and *tonic* skin conductance level (SCL) they are both described as a continuous background experience. Whereas *phasic* emotions *phasic* skin conductance responses (SCRs) are short intense experiences that can heighten *tonic* emotion (Tan, 1998) and SCL. The SCR is formed when stimuli elicits *phasic* activity in the SCL, deflecting the EDA signal upwards, increasing SCL amplitude and forming a mountain shaped peak in the SCL (Braithwaite et al. 2013: 4). The measurement unit for skin conductance is microsiemens (μS) (Boucsein, 2012:156), which was used in the 'Terror & Tension' experiment to determine SCR amplitude. To define the process of a SCR psychologists have created specific thresholds that pertain to the duration (seconds) of four different stages: Latency, rise time, amplitude (SCR peak) and recovery (Dawson et al. 2009). For example, the onset of the fear stimulus triggers the start of the latency period, which takes 1.0-3.0 seconds before the skin conductance level displays a deflection in a vertical upward direction (start of rise time) and takes 1.0-3.0 seconds until the rise time reaches peak amplitude forming the SCR. This is then followed by a gradual decline through the recovery stage, which can take up to 20.0 seconds to complete (Dawson et al. 2009: 163).

The ‘Terror & Tension’ experiment places a special emphasis on the relationship between fear stimuli presented in a horror film clip and activating two types of SCR, one within the classified SCR with a rise time of 1.0-3.0 seconds and a second SCR exceeding the 3.0 second duration limit. Psychophysiologists have determined specific parameters that define an SCR, such as latency and rise time being 1.0-3.0 seconds and recovery time up to 20.0 seconds, however, their relationship to psychophysiological processes are not well understood at this time (Dawson et al. 2009: 166). Although latency, rise and recovery time can be measured as independent variables (Dawson et al. 2009: 166), rise time is rarely studied or used as an independent variable (Boucsein, 2012: 226). When considering rise time, duration can inform us about the durability of an anxiety response to a fear stimulus, and provides a good reason to investigate rise time durations that exceed 3.0 seconds. Furthermore, no psychophysiological studies have investigated the relationship between SCR rise time and suspense, even though suspense is an anticipatory mediation experience to delay the presentation of a specific story outcome event (de Wied, 1994).

When considering Sylvia Kreibig’s study of 134 psychophysiological studies, only 3 studies used SCL as the main EDA component to measure suspense (Kreibig, 2010), even though there were SCRs present. We can gain a greater insight about measuring a fear stimulus by identifying the dominant EDA component that measures the emotion fear. From Sylvia Kreibig’s review of the 134 psychophysiological studies, 51 measured the emotion fear, with 38% recording participants’ responses using EDA, with 60% (21) using SCL as the main EDA component while only 17% (6) used film clips as a stimulus. The evidence from these studies indicate that SCL is a preferred way of measuring suspense and fear, with film clips being rarely used as a fear stimulus to elicit the emotion fear. Therefore, the ‘Terror & Tension’ experiment breaks new ground in measuring suspense as an anxiety response to fear stimuli in film clips and by defining an anxiety response that exceeds a 3.0 second rise time duration. Consequently, this experiment offers film studies and media psychology the basis of a new theory of measuring suspense using short horror film clips. Defining suspense within the classified SCR rise time of 1.0-3.0 seconds and identifying the duration threshold for a SCR that exceeds 3.0 seconds will be discussed further in

chapter 3. The discussion will now turn to the key challenges of recording EDA and how these are addressed in the 'Terror & Tension' film experiment.

Key Challenges Associated with EDA Recording

There are three key issues that arise when recording participants' EDA: hypo-responders, hyper-responders (Braithwaite et al. 2013) and amplification of the electrical signal (EDA) (Boucsein, 2012). Hypo-responders have very low levels of skin conductance and rarely respond with SCRs. Based on psychophysiological studies, it is estimated that 10-25% of participants (Boucsein, 2012: 174) in the 'Terror & Tension' experiment will be hypo-responders even when presented with a fear stimulus in horror film clips. The are many reasons why participants are hypo-responders, for example, in the 'Terror & Tension' experiment participants could be desensitized to fear stimuli in the horror film clips either because they have either watched the same stimulus in a horror film before or they are used to watching similar fear stimuli by watching horror films on a regular basis. Another problem can be the psychophysiological equipment. For example, Velcro straps that attach the electrodes to participant fingers can be too tight and restrict blood circulation restricting possible electrical changes in the skin (Mind Media, B.V n.d.). To eliminate hypo-responding from the 'Terror & Tension' experiment, 26% additional participants were recruited on top of the proposed sample group quantity, which will be discussed in chapter 3.

Hyper-responders are a participant group that create false EDA readings by producing a frequency of 1-4 SCRs per minute, during a baseline recording of EDA when a participant does not receive a specific stimulus to elicit an SCR. These SCRs are classified as non-specific *phasic* skin conductance responses (NS-SCRs) and are often used to measure participant response during interval between stimulus presentations. However, the film experiment focussed on measuring viewers' EDA response to fear stimuli presented in 32 film clips. With the design of the film experiment including immediate viewer feedback after each film clip there was no time to record viewers' EDA during intervals between film clips. Furthermore, measuring NS-SCRs can be problematic because participants could elicit SCRs without a specific presentation of a stimulus with viewers taking a deep breath or moving (Dawson et. al., 2009). SCRs

can also be elicited by anticipation of a stimulus, especially if a participant's thoughts are linked to feelings of anxiety or fear (Boucsein, 2012: 382-385; Nomikos et al. 1968: 204). The discussion will now turn to EDA signal drift which is an amplification error in SCL that occurs during the long EDA recordings (Boucsein, 2012 :188).

EDA Signal Drift

EDA signal drift is a common problem when recording EDA during long experiments and with the 'Terror & Tension' film experiment being 40 minutes in duration we would expect SCL drift to occur. EDA drift is caused by two factors the polarisation of the between two silver chloride (Ag-AgCL) dry electrodes electrodes that are attached to the skin and environmental issues concerning room temperature and humidity (Boucsein 2012). Polarisation is created using exsomatic direct current (DC) recording combined with sweat moistens the skin between the electrodes and skin, creating amplification errors in SCL and artificially increasing SCL amplitude (Boucsein, 2012). To reduce SCL drift from the film experiment short film clips were used (1.0-90.0 seconds), which also provides another good reason to use short film clips in the film experiment. Moreover using *phasic* skin conductance responses (SCRs) to accurately measure viewer physiological responses to stimuli in a film clip also reduces the effects of SCL drift distortion of the EDA data because rise time duration in the experiment is very short, between 1.0-14.0 seconds.

The process to eliminate the SCL amplitude distortion, each viewer's EDA data were matched to each film clip and matched to EDA data by the millisecond. An EDA data baseline point was created where the EDA data intersected the start of the film clip. By subtracting the value of the skin conductance level (amplitude), the EDA data start point for all the film clips would be 0µS. For example, if the start point of the skin conductance amplitude was 0.500 µS, 0.500 µS would be subtracted, which would equal 0µS, thereby, creating an EDA 0µS baseline point for each film clip. The environmental factors were controlled by maintaining a room temperature of 23C and high humidity by air conditioning (Boucsein, 2012). The discussion will now turn to the EDA recording device and software that was used in the 'Terror & Tension' experiment.

Confounding Variables

Experiment design involves limiting confounding variables because they can offer alternative reasons why a participant responded to specific stimuli. In the 'Terror & Tension' film experiment many confounding variables were eliminated to ensure the emotions anxiety and fear were the dominant emotions. For example, as mentioned earlier the emotion disgust was virtually eliminated from the film experiment because there were no gory scenes which are common in horror films. Others proved impossible to eliminate, for instance interest cannot be separated from the experience of suspense with EDA recording being able to link cognitive states, emotion, sympathetic arousal and attention indicates other confounding variables will be present in the EDA data sets.

The most common EDA variable that cannot be eliminated from the film clips is an orientation response or reflex can elicit phasic skin conductance responses (SCRs), such as when a camera shot changes, camera movement occurs and visual or aural stimuli that is presented in the film clip. Scientific evidence indicates orientation responses occur when object image stimuli appears in the field of vision or new objects that move suddenly or looming towards the viewer will be perceived as a threat and trigger high priority attention (Courtney, Dawson, Schell et al. 2010; Franconeri & Simons, 2003). However, when we consider that orientation responses are a natural part of the function of fear stimuli to warn the viewer about a specific threat. They also support the viewer's mood state of feeling frightened as their brain seeks out stimuli that will scare them (Smith, G. 2007). This informs us that the orientation response is actually an important part of the way visual stimuli create a fear stimulus in horror films clips. In regard to aural elements, sound is particularly used in horror films as a direct threat to the viewer in the form of a musical stinger to make the viewer jump from their seats (Hutchings, 2004).

Recording Electrodermal Activity (EDA)

The NeXus-10 platform and BioTrace software were selected for the 'Terror & Tension' experiment because Mind Media B.V, who manufacture the NeXus-10 platform, state that the system is a standard research grade psychophysiological

recording equipment. The system utilises Bluetooth wireless technology to transmit EDA data directly to the BioTrace software on a computer, thereby providing easy access to EDA data during and after an experiment has been completed. The battery powered NeXus-10 platform has the capacity to record different physiological channels, which include the following: brain wave activity (Electroencephalography-EEG); cardiovascular measures (Electrocardiography-ECG); muscle activity (Electromyography-EMG) and electrical changes in the skin (Electrodermal activity-EDA).

To set up the NeXus-10 platform for EDA recording, a detachable carbon coated cable is connected to the NeXus-10 platform and the other end of the cable is attached to participants by two silver chloride (Ag-AgCL) dry electrodes embedded in Velcro straps, which are wrapped around the participants' medial or distal phalanges of the index and middle finger. These areas of the hand have the highest density of eccrine sweat glands (Boucsein et al. 2012: 104-106) and the constant 0.5 voltage across the electrodes creates a direct skin conductance reading using the exosomatic method. Although both medial and distal phalanges can be used in recording EDA data, the distal phalanges (finger tips) are more likely to become damaged through cuts and callouses (Dawson et al. 2009: 163) and more susceptible to movement effects than the medial phalanges (Boucsein, 2012: 105). Therefore, in the 'Terror & Tension' experiment, participants had the two silver chloride dry electrodes attached to the medial phalanges of the index and middle finger (Figure 2.3).

One problem of recording physiological data is that artefacts (errors) can appear in the EDA signal, which contaminates EDA data in two ways. First, an error can occur through power-line (noise) which stems from the cable that connects the NeXus-10 platform to the participant via the two silver chloride dry electrodes. This problem was addressed using the manufacturer's carbon coated power-line cable that creates an active shield to eliminate noise artefacts. Furthermore, even if high frequency noise is detected in the EDA data, errors can be eliminated using a 0.08Hz low-pass filter (Boucsein, 2012: 98). The second error type refers to physiological artefacts through

muscular movements of the body, in particular the hand attached to the two silver chloride (Ag-AgCL) dry electrodes.



Figure 2.3. The two silver chloride (Ag-AgCL) dry electrodes attached to the medial phalanges of the index and middle fingers.

In the 'Terror & Tension' study this problem was reduced by attaching the electrodes to the fingers of the less dominant hand (Dawson et al. 2009: 163) and participants were given instructions to keep this hand in a resting position at all times during the experiment (Boucsein, 2012: 141). Physical movement artefacts can be easily identified through a visual inspection of the EDA data and some movement artefacts can also be eliminated in the same way as noise artefacts by using a 0.08Hz low-pass filter (Boucsein, 2012: 185). To reduce very small artefacts in the EDA signal, a minimum threshold for SCR amplitude was created; traditionally paper recordings of EDA were given a minimum threshold amplitude of 0.05µS, however, technological improvements in the EDA signal resolution through A-D conversion accuracy, enables

digital physiological devices to record at much lower thresholds to 0.01μS, with psychophysiological studies using thresholds of between 0.02 μS and 0.05μS (Braithwaite et al. 2013: 6). In the 'Terror & Tension' experiment the threshold was set to 0.03μS to eliminate any small artefacts in participants' EDA data. We will now turn to EDA channel data sampling rates because they tell us how many EDA data samples are produced over time, which is advantageous when aligning EDA data samples with the fear stimulus in the horror film clips.

The NeXus-10 has an EDA channel data sampling rate of 32Hz, which equates to 32 EDA data samples per second, which roughly aligns to the film clips data set being 30 frames per second. Calibrating EDA data to 1/1000th of a second enables the fear stimulus (horror film clips) to be time locked with viewers' EDA data to ensure accuracy is within a millisecond when attributing a fear stimulus to a specific EDA data such as SCRs. Due to the manufacturer's guidelines concerning the NeXus-10 and BioTrace software, there is a 650 millisecond discrepancy between participants' EDA data and the start of the 32 film clip sequence. This is due to the time it takes the computer to load and start the film clip sequence so the time difference in the EDA data was adjusted so that the 32 film clip sequence start position was aligned with participants' EDA data to millisecond accuracy.

The discussion will now turn to some of the features of the BioTrace software program that operates the NeXus-10 platform via a computer. BioTrace multi-functional software enables EDA data collection, template design for video/film clips in psychophysiological experiments and data and analysis features. For example, in the 'Terror & Tension' experiment the BioTrace software enabled the experiment to be designed so that two computer screens could be used at the same time. One screen for participants to watch the 32 film clip sequence on a laptop and the other computer screen to allow for the observation of participants' EDA signal in real time. BioTrace also has many different data processing and analysis features, including an export function to analyse the EDA data in a different file format, such as an excel spreadsheet, which I found to be practical and time efficient for the analysis of participants' data sets.

Conclusion

In response to Mike Friedrichsen concerns that film scholars and media psychologists have not independently identified the components of suspense thus making it difficult to measure suspense (Friedrichsen, 1996: 329-330 and 338). I first identify the viewer cognitive, emotional and physiological components of suspense that operate though a cause-and-effect paradigm mediated through the temporal qualities that represent a specific story event sequence (see chapter 1). The discussion in this chapter builds on this theoretical definition of suspense and proposes a psychophysiological framework to measure the viewer's experiences of suspense through an experiment design. In particular by defining the core dimension as an anxiety response to fear stimuli presented in short horror film clips.

Although many different emotions can play a role in the construction of suspense, horror films can be reduced to the emotions are interest, fear and anxiety. Interest is a background *tonic* emotion with fear having two purposes: first, acting as a *tonic* emotion to support the viewers' mood state of feeling frightened when watching a horror film and secondly where fear stimuli acts as a *phasic* emotion in a horror film triggering the *phasic* emotion anxiety which commonly occurs because the fear stimuli is presented as a threat or sudden shock. By identifying anxiety as the dominant emotion concerning the mediation process of suspense which is driven by fear stimuli I set out the design of the 'Terror & Tension' film experiment which measures viewer anxiety responses to fear stimuli in horror films clips in terms of durability and intensity. Central to this thesis is a Human Computer Interaction (HCI) mixed methods approach to defining viewer experience of the construction of cinematic suspense in horror films using triangulation where three lines of enquiry produce three different sets of data (quantitative and qualitative) which include: film textual analysis of the film clips, viewer psychophysiological responses and viewer feedback themes and comments. It is anticipated that this holistic approach will offer film studies and media psychology a new paradigm for understanding viewer experience of cinematic suspense in horror films.

Reviewing psychology research methods and experimental design that seek to elicit specific emotions through edited short film clips extracted from commercial films enabled me to identify techniques that were not appropriate for the 'Terror & Tension' experiment, while others procedures and techniques were selected as best practice. Determining the type of short film clip and its duration was controlled by the four narrative structures: vicarious, direct, shared and composite, which work at a local level within a scene of a feature film. This provides a greater understanding of viewer experience of suspense through a formal narrative framework. Selecting films post-2000 was important due to the technological changes that have influenced filmmaking techniques, such as CGI, which appear to be more realistic than traditional methods of special effects and eliminating traditional horror film such as *The Birds* (Hitchcock, 1963), because the film was made in black and white and could produce feelings of nostalgia.

Therefore this chapter builds on the theoretical definition of cinematic suspense (see chapter 1) by identifying the specific emotions related to the construction of cinematic suspense in horror films, in particular fear, which maintains the viewer's mood of feeling frightened when watching the short film clips. Fear also elicits anxiety as a viewer response to fear stimuli presented in horror film clips. The emotions disgust and surprise were also identified and discussed. Cinematic suspense in horror films is measured in terms of the viewer's anxiety responses to fear stimuli in specific suspense narrative structures (vicarious, direct, shared and composite). There were two types of fear stimuli identified to trigger suspense and an anxiety response in the experiment – one to trigger suspense through a surprise event and another to builds suspense over time. Both types of fear stimuli elicited two types of *phasic* skin conductance responses (SCRs) that represent anxiety responses in terms of durability (1.0-3.0 seconds or 3.1-14.0 seconds) and intensity levels (see chapter 3). To increase viewers' anxiety and suspense, three thematic components were added to the film selection criteria: a conflict between protagonist and antagonist; the protagonist being trapped-isolated and the film setting being dark.

Electrodermal activity (EDA) was identified as the most appropriate psychophysiological recording technique to measure viewers' responses to fear stimuli because of its accuracy in measuring anxiety by emotional sweating. Applying a mixed methods approach triangulation to capture textual analysis of the film clips, viewer SCR's and viewer feedback comments for each film clip offers a new paradigm to measure and analyse the construction of cinematic suspense in horror films and viewer experience. We shall now turn to the chapter 3 where the psychophysiological framework to measure cinematic suspense supports the development of an EDA Model of suspense.

CHAPTER 3
EDA Model of Suspense

This chapter proposes an EDA model of suspense that measures and defines viewers' experiences of suspense when watching horror film clips. The EDA model of suspense is underpinned by a theoretical psychophysiological framework that measure viewer experiences of suspense. The model comprises of two types of *phasic* skin conductance responses (SCRs) determined by rise time ranges here referred to as 'mediation peaks'. Each mediation peak has a different rise time range (duration) that represents an anxiety response to fear stimuli presented in the horror film clips from the 'Terror & Tension' film experiment. These mediation peaks will be referred to as 'Momentary Fear' (1.0-3.0 seconds duration) and 'Extended Fear' (3.1-14.0 seconds). The EDA model of suspense also has four levels of anxiety intensity allowing viewers' anxiety response to fear stimuli to be measured by durability and intensity.

To find out whether the EDA model of suspense could measure suspense in terms of viewer anxiety durability and intensity, a testing procedure was designed. This validation process involved a test predicting a match between mediation peak responses to a specific fear stimulus in a film clip. The test involved two stages: the first stage was to predict anxiety durability choosing between a 'Momentary Fear' and 'Extended Fear' response. The second stage involved the prediction of intensity levels 1-4. The procedures and techniques used for EDA data treatment, the design and testing of the EDA model of suspense uses a mixed method approach which applies a broad qualitative analysis of quantitative data sets and offers film studies and media psychology a synthesised approach to analysing suspense in horror films. The chapter will begin with a discussion about the 'Terror & Tension' film experiment concerning participant selection and the film experiment process. This will be followed by viewer data treatment, the validation of the EDA model of suspense and mediation peak analysis in regard to viewer psychophysiological responses across the film clips. The final section of the chapter will turn to the analysis of individual viewer mediation peak responses and how they match or mismatch with viewer feedback comments. Viewer feedback comments are also discussed and in terms of the most popular words that viewers used to describe a fear stimulus by cinematic technique (cinematography, sound and mis-en-scène) and popular words used to describe their fear response.

Terror & Tension Experiment Overview

Viewers who took part in the film experiment had to satisfy specific criteria which included the enjoyment of watching horror films, being over the age of eighteen and healthy. 27 viewers (14 Male and 6 female) were selected for the film experiment and took part in the experiment alone. On arrival each viewer completed a questionnaire to identify their viewing history of horror films so that viewers who had previously seen the films in the experiment before could be identified. Viewers then watched 32 horror film clips that were based on Susan Smith's suspense narrative model, vicarious, direct, shared and composite suspense. While watching the film clips viewers had their EDA responses recorded using the NeXus-10 psychophysiological recording device and Biotrace software. Viewer verbal feedback about each film clip was recorded at the end of each film clip to gain their instinctive responses.

Participant Selection

Participant recruitment was based on a set of criteria which included the following: firstly, volunteers were selected based on their enjoyment of watching horror films because participants who do not like horror films may not complete the experiment or may provide irrelevant feedback after watching the film clips. It could also be quite distressing for such participants who do not like horror films, which raises ethical issues concerning the experiment. Secondly, as *The Descent* and *Quarantine* were classified 18 by the British Board of Film Classification all participants had to be over the age of 18 to take part in the experiment which made consent more clearly defined. Thirdly, all participants that declared any of the following health conditions were excluded for the experiment: anxiety, epilepsy and photosensitive epilepsy, heart conditions, blood pressure, stroke and heart complaints, as for example, participants with anxiety disorders are more likely to elicit a higher frequency of phasic skin conductance responses (SCRs) when responding to a fear stimulus than healthy participants (Boucsein, 2012: 410-440). Volunteers with heart conditions, stroke and high blood pressure were eliminated due medication such as beta-blockers influencing the EDA signal (Boucsein, 2012). Finally, volunteers with a physical disability were excluded from the study when additional resources and support were required that go beyond what could be provided during the experiment.

Determining Participant Sample Size

A 'within-subjects design' was selected for the film experiment because all viewers would be watching the 32 film clips in the experiment (Goodwin, J & Goodwin, K. 2014: 174). Many psychologists determine their participant sample size using statistical power analysis through hypothesis significance testing. Sample size and statistical power are linked together so if the experimenter increases the participant sample size statistical power also increases (Goodwin, J & Goodwin, K. 2014: 135). A high statistical power reduces the error of not finding an effect when one actually exists in the experiment (Goodwin, J & Goodwin, K. 2014: 128-137). However, with the film experiment not conforming to standard psychology methodology such as hypothesis significance testing based on one research question, a calculation concerning the statistical power to define the participant sample size for the experiment could not be made. In order to gain an estimated statistical power I used a single sample t-ratio power table by Bart Weathington, Christopher Cunningham and David Pittenger (Weathington et al. 2012).

The table provided an approximate quantity of participants required to gain a high statistical power of 95%. The table had the following settings, the alpha (α) level (probability) was set at .05 and a large effect size (fear stimulus) was selected in the experiment with a value of 0.80. On visual inspection in the table the column headings Alpha level .05 (probability) and large effect 0.80 were identified and the recommended participant number size was located in column (n). For a statistical power of 95% the film experiment required 20 participants (Weathington et al. 2012). With the possibility of up to 25% participants being hypo-responders (see chapter 2) and possible technical problems affecting data collection I recruited 27 viewers (17 male and 10 female) for the film experiment. EDA data from 7 viewers were eliminated from the analysis stage because of 5 participants being hypo-responders and 2 others involved technical issues with the EDA recording device. From the remaining 20 participants there were 14 males and 6 females.

Film Experiment Process

On arrival, each viewer completed a questionnaire about their past film viewing experience of horror films. They were then asked to sit at a desk with a computer screen in front of them for the pre-test experiment procedure (see chapter 2). The purpose of the pre-test experiment procedure was so they could practice verbal feedback into a microphone after watching a film clip. Two short film clips were used in the pre-test from the thriller *Taken* (Morel Pierre, 2008) and science-fiction thriller *I am Legend* (Francis Lawrence, 2007). Each participant was instructed beforehand to relax, watch each film clip and follow onscreen instructions about providing feedback after a film clip had finished. When prompted by onscreen instructions viewers used a microphone to provide their feedback, which was recorded. Through observations and talking to the viewer about their experience of the pre-test I was able to detect when the viewer was ready to take part in the film experiment.

Once the pre-test experiment was completed the viewer was moved to another seat with a 15" screen laptop in front of them, which was used to show the film clips during the experiment (Figure 3.1). The experiment was carried out in a dark room to enhance the impact of the fear stimulus from the horror film clips. To reduce environmental EDA drift the room temperature was set at 22C and low humidity was controlled by air conditioning. Once the viewer was comfortable two silver chloride (Ag-AgCL) dry electrodes were attached to the medial phalanges of the fingers of the least dominant hand using the Velcro strap (see chapter 2). The next stage was to record the viewer's EDA signal and once a consistent signal was detected the experiment was ready to begin. The EDA data signal was observed by the experimenter facilitator during the film experiment on the computer screen monitor, which was not visible to the viewer (Figures 3.1 and 3.2). The position of the two screens being 1 metre apart enabled me to observe the viewer's EDA signal on screen and their reactions during the film experiment.



Figure 3.1. Film experiment with a participant sitting in front of a laptop and computer screen monitor showing his EDA signal on the large computer monitor.



Figure 3.2.The experimenter's screen to observe the EDA waveform signal (pink in colour) plotted against time on a chart.

The lights were then switched off so the room was in complete darkness ready for the experiment to begin. The film experiment included 32 film clips from eight horror film that matched instances of Susan Smith's four suspense narrative structures (vicarious, direct, shared and composite). The film clip durations were between 1.0-90.0 seconds and the order in which viewers saw the clips was randomised so that each viewer watched a different film clip sequence within each narrative structure. The viewer was notified when the film experiment started with a verbal recorded message ('the experiment is about to start') from the laptop. The Biotrace software synchronised the start of the film experiment with the viewer's EDA data so that phasic and tonic skin conductance responses could be detected and matched to visual and aural elements in each film clip. The viewer then watched the first 16 film clips (various and direct suspense) followed by a two minute break to reduce fatigue and habituation (see chapter 2). Once the two minute break had finished the viewer watched the next 16 film clips (shared and composite suspense). After each film clip the viewer was prompted by a message on the screen to provide verbal feedback (up to 30 seconds) by talking into a microphone about the film clip they had just watched. Their feedback was recorded so that analysis could be made about their personal experience of each film clip and will be discussed later in this chapter.

EDA Data Treatment

The viewers who took part in the film experiment produced a total 701,440 EDA data points that were captured across the 32 film clips in the experiment. Before any data analysis could be made all viewer EDA data sets had to go through a data treatment process, which began with matching viewer EDA data points with each film clip from the film experiment. Bio-trace software did not have the functionality to complete this procedure so I exported viewer EDA data sets from the film experiment into a Microsoft Excel spreadsheet for data treatment. For example all viewer EDA data points were exported into a spreadsheet and were then matched in time (milliseconds) with each film clip. This process involved synchronising the exact start time of the 32 film clip sequence for each viewer. This was achieved using a visual marker in the EDA data set which had been created in real time automatically by the Bio-trace software at the beginning of the film experiment. The visual marker acted as a data

point so that all film clips and gaps in time between film clips could be easily identified and matched to EDA data points. All viewers' EDA data sets were then transferred to four different Microsoft Excel spreadsheets, one for each narrative structure (vicarious, direct, shared and composite). This provided easier access to all viewer EDA data sets that match film clips in their relevant narrative structure.

Noise Artefacts and Smoothing

The next step was to reduce noise artefacts using a technique called 'smoothing' which transforms the EDA signal from having tiny jagged lines characterised by noise into a smooth waveform signal (Figure 3.3). This process is essential to define accurate measurement of EDA components tonic skin conductance level (SCL) and phasic skin conductance responses (SCRs) (see chapter 2).

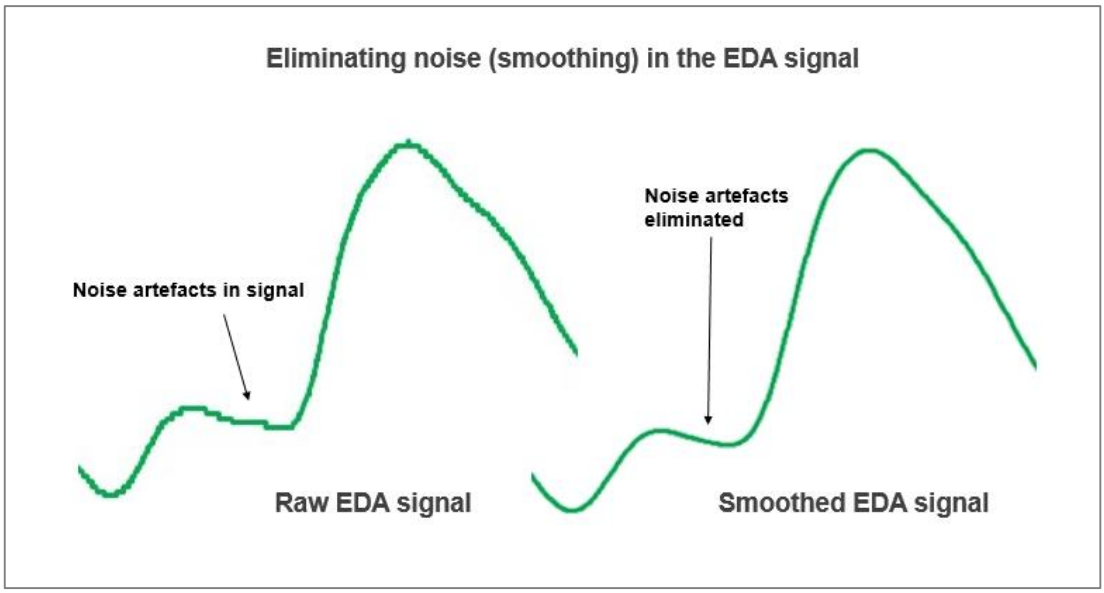


Figure 3.3. Eliminating noise artefacts in the EDA signal using Microsoft Excel Software.

Unlike SCL, which reacts slowly to a fear stimulus, SCRs are of particular interest because they indicate by the millisecond when viewers have responded to a fear stimulus presented in the film clips. In order to smooth the EDA signal, in the Microsoft excel spreadsheet I created an average EDA data point. For example an average EDA data point based on 63 EDA data points gave the most effective smoothing result across all viewers. Although smoothing is essential for EDA data analysis, the downside is that smoothing deletes EDA data points resulting in a

negative impact of the EDA signal amplitude level. For example, smoothing decreased the EDA signal amplitude level across viewers by an average of 10%. Once smoothing has taken place you cannot include the missing EDA data points into the analysis because this would include noise artefacts, which need to be eliminated from the EDA signal. This means that the true EDA data sets are on average 10% higher in amplitude than the smoothed EDA data sets and that the smoothed EDA data sets used in the analysis were in fact much stronger than their data points suggest.

Reducing SCL Drift

The next step was to reduce the effects of SCL drift (Figure 3.4) which is common during long experiments, creates an exaggerated SCL amplitude level and therefore contaminates viewer EDA data (see in chapter 2).

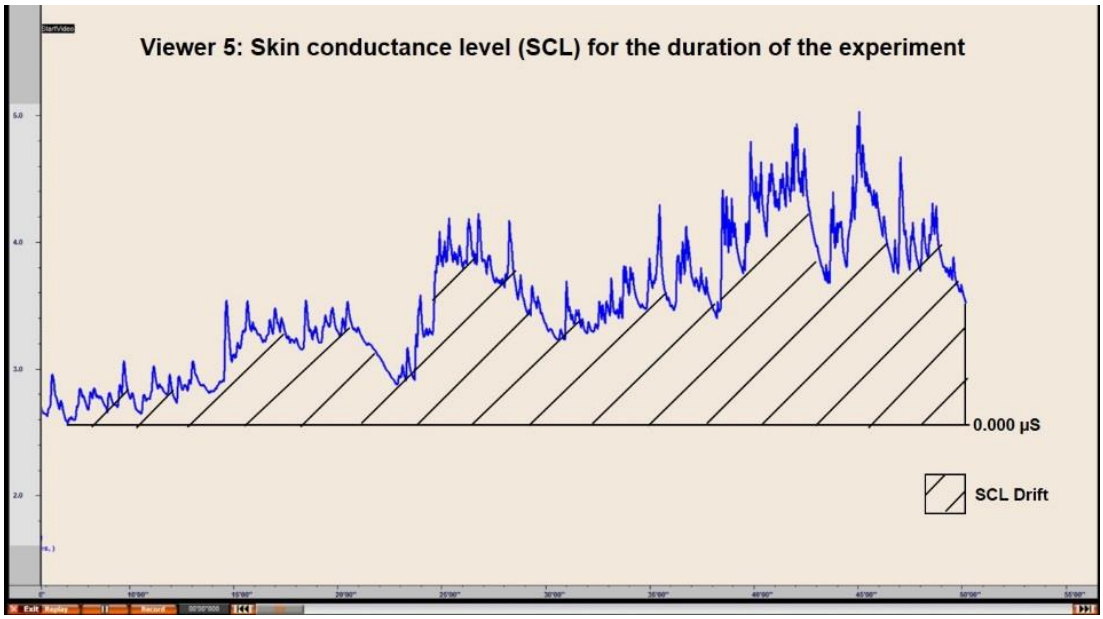


Figure 3.4. Viewer 5: Skin conductance (SCL) signal drift shown in the shaded area.

The elimination of SCL drift was achieved in two ways. First by using short film clips with a duration of 1.0-90.0 seconds. Secondly, only SCRs were used in the analysis because SCRs are more accurate than SCL to measure viewer physiological responses to specific fear stimuli in a film clip. An example will be provided in the section defining *phasic* skin conductance response (SCR), which discusses measurement

accuracy between SCL and SCR. To reduce the effects of SCL drift the SCL amplitude was adjusted to zero at the time it intersects the beginning of a film clip. In order to do this a column was inserted into the spreadsheet with the heading 'Start Point'. All EDA data points in this column displayed the same EDA amplitude value which occurred at the beginning of the film clip. For example, if the EDA amplitude is 2.916microsiemens (µs) when the EDA signal intersects the time when the film clip starts the EDA amplitude needs to transform to 0.000µs baseline point (Figure 3.5).

Column A	Column B	Column C
Actual EDA (Smoothed)	EDA at Zero	Start Point
2.916	0.0000	2.916
2.059	0.0004	2.059
2.059	0.0007	2.059
2.060	0.0011	2.059
2.060	0.0014	2.059
2.060	0.0018	2.059
2.061	0.0021	2.059
2.061	0.0024	2.059
2.061	0.0027	2.059
2.062	0.0030	2.059
2.062	0.0033	2.059
2.062	0.0036	2.059
2.062	0.0039	2.059
2.063	0.0042	2.059
2.063	0.0044	2.059
2.063	0.0047	2.059

Figure 3.5. Reducing the effects of SCL drift by adjusting the SCL to zero when the SCL intersects the beginning of the film clip, as shown at top of column B 0.0000.

This is achieved by subtracting the EDA amplitude value 2.916µs by 2.916µs in the 'Start Point' column C. The 'Start Point' amplitude value 2.916µs is then copied below in all the cells of the Start Point' column for the entire duration of the film clip. The EDA amplitude for the film clip is determined by subtracting the difference between the 'Start Point' (2.916µs) in column C with the changes in the EDA signal amplitude level (Column A) for each cell during the film clip. The differences in the EDA signal are shown in column B, starting from zero amplitude in figure 3.5.

SCR Amplitude Minimum Threshold

Although smoothing of the raw EDA signal reduces noise and some movement artefacts the accuracy of digital EDA recording means that tiny movement artefacts with a 0.01µs amplitude can be mistaken for an SCR. These type of artefacts are caused by the viewer moving during the experiment, in particular the fingers that are attached to the two silver chloride (Ag-AgCL) dry electrodes. Although viewers had the electrodes attached to their least dominant hand (e.g. right handed people have electrodes attached to the left hand) to minimise movement, viewers were instructed to keep the hand attached to the electrodes still during the experiment to keep movement artefacts to a minimum. To eliminate the tiny movement artefacts from viewers EDA data I selected a minimum SCR threshold amplitude of 0.03µs, which is within the recommended range of 0.01-0.05µs (Boucsein, 2012: 157).

Defining *Phasic* Skin Conductance Response (SCR)

Although psychophysiological studies have measured suspense using EDA by detecting changes in viewers' *tonic* skin conductance level (SCL) to fear stimuli in a film clip (Boucsein, 2012; Kreibig, 2010), *phasic* skin conductance responses (SCRs) provide greater accuracy in measuring changes in viewer skin conductance to specific fear stimuli. For example, if there were 4 fear stimuli in a film clip SCL would show a gradual increase in SCL amplitude at some point during the film clip, which makes it virtually impossible to match changes in SCL amplitude to specific fear stimuli by the millisecond which is required when matching fear stimuli with a physiological response. Furthermore SCL does not have a specified latency, rise or recovery time like SCRs which is essential to understand viewer's physiological and psychological responses when matched to fear stimuli in a film clip. As mentioned previously using SCL to measure fear stimuli is also problematic because of SCL drift, which contaminates the EDA data by exaggerating SCL amplitude levels. Unlike the slow movement of skin conductance level SCRs are elicited more rapidly and occur on the presentation of fear stimulus. In the above example of 4 fear stimuli that occurred during a film clip and taking into account individual differences, viewers will respond with either 0-4 SCRs. This informs us that SCRs are an accurate method of matching individual physiological responses to specific fear stimuli in a film clip.

A *phasic* skin conductance response (SCR) comprise of four phases, latency, rise time, amplitude peak and recovery time. The first phase latency occurs when a fear stimulus triggers an SCR and lasts between 1.0-3.0 seconds. According to Wolfram Boucsein latency minimum duration is 1.0 second because of the time it takes the human body to process a stimulus. This process involves a neural network that triggers the autonomic nervous system (ANS) to activate the sweat glands and allow sweat to rise to the surface of the skin (Boucsein et al. 2012: 1025). Although longer latency windows in excess of 5.0 seconds have been recorded in psychophysiological studies the consensus in psychophysiology is latency duration should be 1.0-3.0 seconds (Dawson et al. 2009: 165). The second phase is rise time, which starts when the EDA signal deflects upwards and finishes when the EDA signal has reached peak amplitude. Although the rise time duration has been defined as 1.0-3.0 seconds, rise time has rarely been studied or used as independent parameter (Boucsein, 2012: 226), because its psychophysiological response are not understood (Dawson et al. 2009). This provides a good reason to investigate whether there is a relationship between rise time duration and a fear stimulus. The longer the rise time the more durable the stimulus in maintaining a viewers heightened state of sympathetic arousal.

The third phase is SCR peak amplitude and is of particular interest to psychologists because it informs them that a participant has responded to a specific stimulus. SCR peak amplitude appears more relevant in terms of an intensity response to fear stimuli because the higher the amplitude the greater intensity (Boucsein, 2012). The fourth is SCR recovery time when SCR amplitude declines to the same EDA amplitude level at the start of latency. The full SCR recovery time does not occur very often because the sweat produced to elicit the initial SCR makes the stratum corneum (top layer of the skin) wet and is more conductive than when dry, creating a slow recovery (Boucsein, 2012). According to Dawson et al. 2009 the recovery time is measured by 50% of the actual recovery time of 2.0-10.0 second duration (Dawson et al. 2009). Recovery time will not be used in the analysis because it does not inform us about the durability and intensity of a viewer's psychophysiological response to a fear stimulus.

SCR latency, rise time and amplitude will be used in the analysis of viewer EDA data sets to measure anxiety (suspense) responses to fear stimuli in the film clips. This is because SCR latency tells when a fear stimulus triggered an SCR and the rise time measures the durability of an anxiety response to fear stimuli. The SCR amplitude determines an anxiety response to fear stimuli by its level of intensity. To analyse anxiety response durability I decided to use two different SCR rise time ranges, which include the psychophysiological standard rise time of 1.0-3.0 seconds and for the second I proposed a rise time duration of 3.1-14.0 seconds (Figure 3.6).

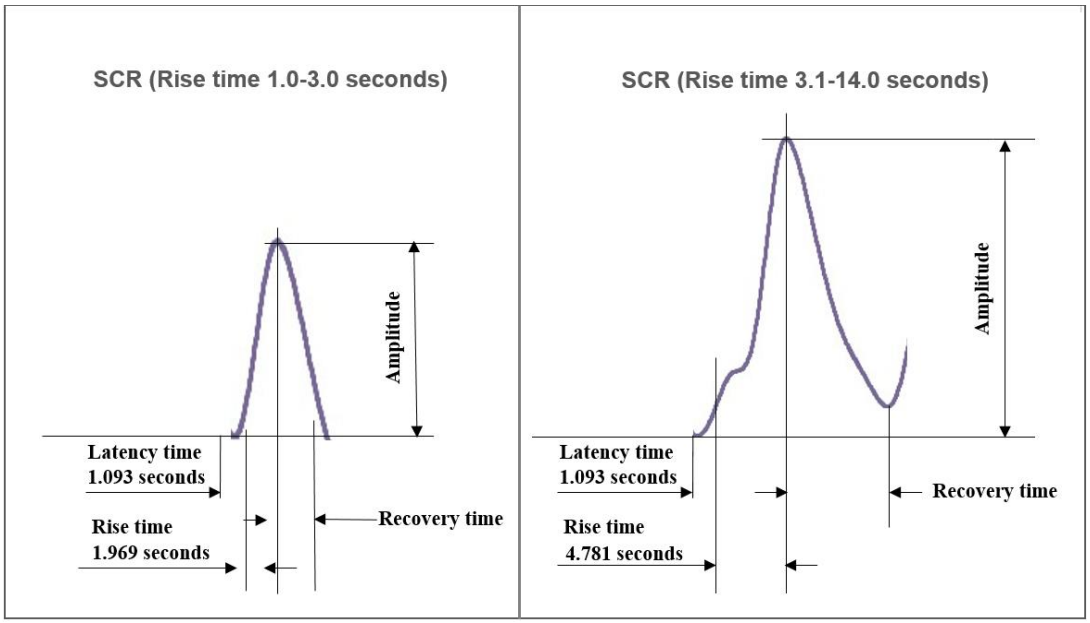


Figure 3.6. SCR shape: Latency, rise time, amplitude and recovery time.

Traditionally, psychophysiologists would classify the proposed second rise time range as slow fluctuations in *tonic* skin conductance level (SCL) (Boucsein, 2012; Dawson, et al. 2009), however, the findings from the film experiment found that SCRs with a rise time of 3.1-14.0 seconds had a well-defined latency and peak amplitude just like the standard SCR which has a rise time of 1.0-3.0 seconds. Although SCR latency, rise time and recovery time can be measured as independent variables 'their relationship to psychophysiological processes is not as well understood at this time' (Dawson et al. 2009: 166). This supports the use and analysis of the SCR rise time of 3.1-14.0 seconds in terms of longer durability of a fear response from a fear stimulus in a horror film clip, which has not been studied by psychologists. In figure 3.7 shows

a graphic representation of *phasic* skin conductance responses punctuating *tonic* skin conductance level.

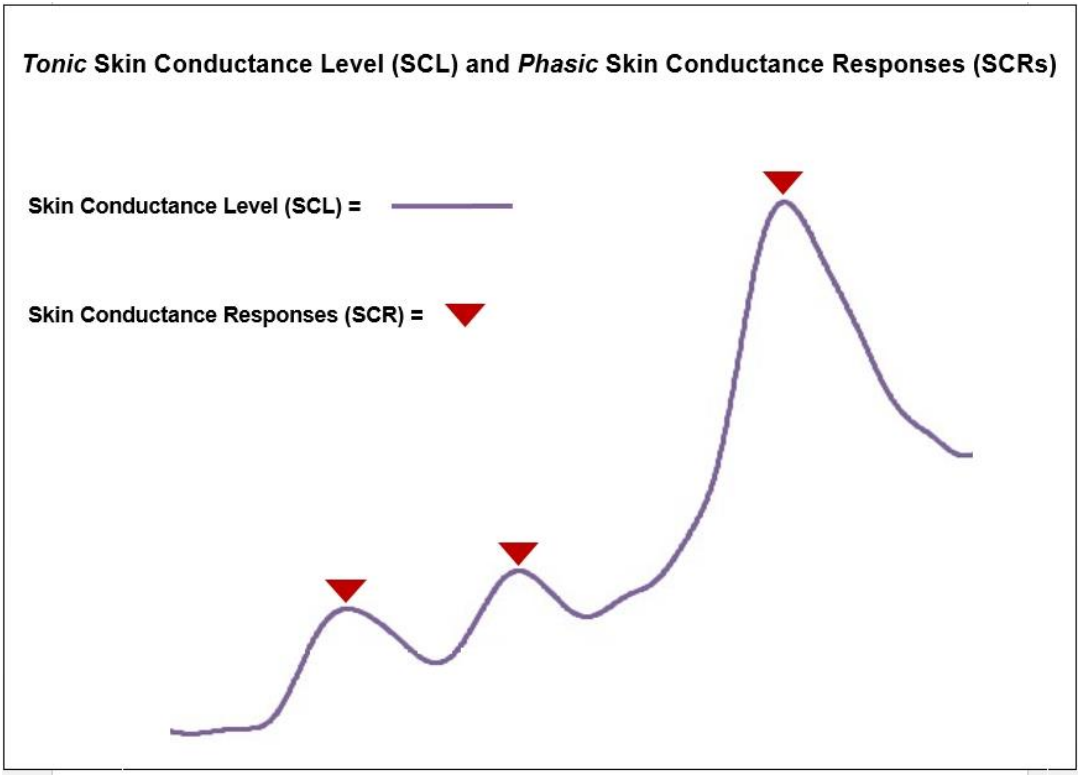


Figure 3.7. Tonic skin conductance level and phasic skin conductance responses.

Identifying SCRs in the EDA Signal

The identification of SCRs in the EDA signal was carried out through a visual inspection of viewer EDA data sets across all film clips. First an EDA baseline data point (lowest EDA data point preceding the SCR peak amplitude) was selected, followed by the duration between the EDA baseline data point and SCR peak amplitude (Figure 3.8). To determine the SCR latency and rise start time durations and amplitudes involved further analysis of the viewer's EDA data set. In order to find the SCR latency, I selected film clips where an SCR occurred at the beginning of the film clip as this represented a fear stimulus event. I then identified the duration in milliseconds between the stimulus event and SCR amplitude. Then, by using Ekart Thom's rise time calculation, I was able to calculate the latency duration by subtracting the rise time duration from the duration between the stimulus event and SCR amplitude peak. I decided to create an average latency duration for each viewer across the four narrative structures (vicarious, direct, shared and composite). I then

created a latency test of 50 SCRs that were identified across all viewers that occurred immediately when a film clip started (stimulus).

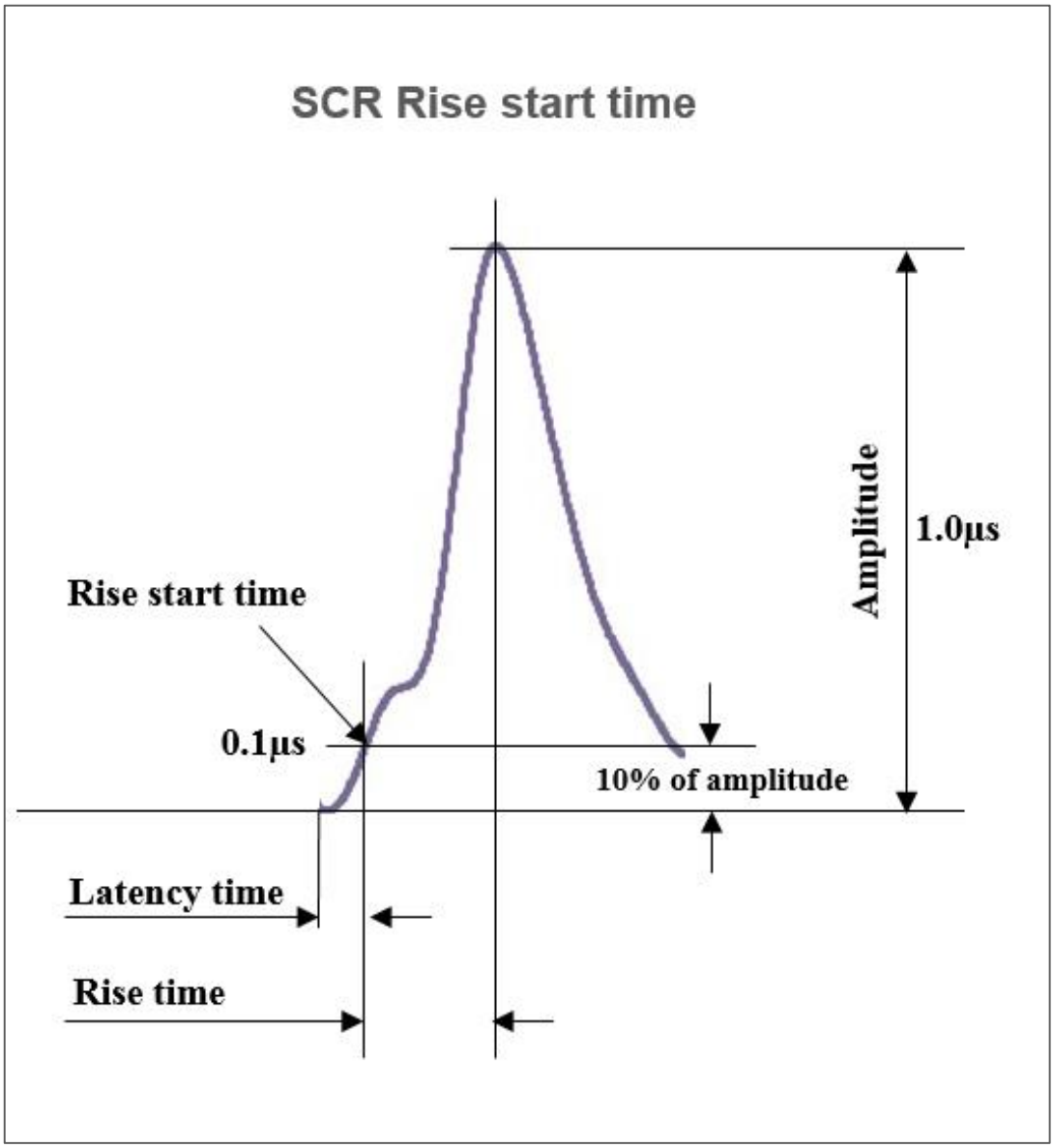


Figure 3.8. SCR rise time calculation based on Eckart Thom's theory.

The next stage was to calculate the rise start amplitude level and to identify the rise start time, Wolfram Bousien recommends German physiologist Eckart Thom (1988) theory that determines rise time amplitude level at 10% of the SCR amplitude (Boucsein, 2012: 159). For example if the SCR amplitude was 1.0µs then 10% would be 0.1 µs which represents the rise start time amplitude value. I would then visually inspect the EDA data points and search for the 0.1µs amplitude that occurred after the

baseline point (lowest EDA data point preceding the SCR peak amplitude) and before the amplitude peak. Once the value had been found I was able to find at the time at which the rise time started. The latency duration was identified by a visual inspection of the EDA data points when the rise time started and this data was then used to create an average latency duration for each viewer that would be used for each narrative structure. I then created a Microsoft Excel spreadsheet which included SCR latency, rise time and amplitude for all viewers by narrative structure (e.g. 'Master_SCR_Analysis_Vicarious').

Mitigating Influences

One challenge of the film experiment was to identify whether viewers' experienced habituation, where the viewer becomes familiar with a fear stimulus over time (see chapter 2) showing a decline in their EDA signal during the film experiment. Habituation was dealt with in the experiment design with viewers having a 2 minute rest period after they had watched the first two narrative structures vicarious and direct suspense (see chapter 2). Habituation was also reduced by the 32 film clips having different types of fear stimuli and that the film clips having a short duration (1.0-90.0 seconds). This created a succession of bursts of fear rather than a similar continuous fear stimulus with longer duration. The effects of habituation were also mitigated by viewers providing verbal feedback response after each film clip because they were involved in another activity which breaks up the momentum of watching a continuous film sequence and keeps them mentally alert.

Quantifying Psychophysiological Cinematic Suspense

As explained in chapter 1, cinematic suspense is essentially a mediation process of a cause-and-effect paradigm (Bordwell 1985), cognitively comprising of anticipation (Zillmann, 1996; de Wied, 1994; Truffaut, 1985) and at times varying levels of uncertainty (Zillmann, 1996; Hoffner & Cantor, 1990) about the presentation of a specific story event. This is often referred to as an initiating event (cause) (Brewer & Lichtenstein, 1982) that is directed at the viewer (Smith, S. 2000; Hutchings, 2004) or involves conflict with fictional character(s) (Zillmann, 1996) and influences viewers' anticipations and assumptions about future story events (effect), often including the

interests of specific fictional characters (Tan, 1998; Carroll, 1996; Zillmann, 1996). Levels of uncertainty can decrease or increase viewer anxieties (Zillmann, 1996) during the mediation process and in some situations uncertainty does not exist (see in chapter 1).

Suspense as a mediation process in horror films elicits a strong anxiety (*phasic* emotion) response in the viewer, triggered by fear acting as another *phasic* emotion through the presentation of intermittent fear stimuli to scare the viewer. The viewer's mood state of feeling frightened is sustained by fear also acting as a *tonic* emotion. Greg Smith explains that viewers knowing that they will be watching horror films builds their expectations of being scared and creates a mood of feeling frightened. This mood state alerts the brain to search for fear stimuli that will support their mood of being frightened, producing a high anxiety response (Smith, G. 2007: 38). According to Cynthia Hoffner and Joanne Cantor, viewer anxieties will increase when the viewer has prior knowledge of a fear stimulus that scares them. In their study children were forewarned of a specific fear stimulus they were about to watch and were more likely to express anxiety by worrying about what will happen in a threatening scene (Hoffner & Cantor, 1990: 345). Therefore participants (viewers) taking part in the 'Terror & Tension' film experiment were expecting to watch something frightening and sought out stimuli that made them feel scared and increase their anxieties. This informs us that viewers who took part in the film experiment were more likely to experience an anxiety response during the construction of suspense.

It is then possible to quantify psychophysiological suspense by measuring viewer anxiety responses to fear stimuli in horror film clips using two variables I name as durability and intensity. This forms an EDA model of suspense which defines *phasic* skin conductance response (SCR) rise time duration as anxiety durability and SCR amplitude as anxiety intensity. Combined, these two variables determine the viewer's anxiety response to fear stimuli presented in the horror film clips. Recording these two types of *phasic* fluctuations in the EDA signal provides an insight into how viewers unconsciously respond independently and collectively to the same fear stimulus in a film clip. Viewers also frequently experience multiple SCRs that occur at different

moments during a film clip, creating a psychophysiological pattern of suspense. These multiple SCRs may each have a different rise time duration and amplitude, which illustrates how viewers respond differently to fear stimuli and how their anxiety response changes during a film clip. This is because our physiologically pattern is different to our conscious experience in determining what fear stimuli triggered the strongest or weakest anxiety response and provides another good reason to measure suspense using psychophysiological recording and EDA. The discussion will now turn to the durability of a fear response by measuring the SCR rise time duration.

Fear Stimuli (durability)

I propose two different SCR rise time ranges that indicate anxiety durability of fear response when viewers react to a fear stimulus shown in a horror film clip. A short rise rime range of 1.0-3.0 seconds is a condensed form of anxiety and the long rise time range 3.1-14.0 seconds is a prolonged form of anxiety. These two SCRs are referred to as 'mediation peaks' because suspense is a mediation process that starts with the presentation of a fear stimulus, which triggers an anxiety response until suspense is resolved through an outcome response and/or an outcome future event. With the 'mediation peaks' detecting a specific fear stimulus they were named as 'Momentary Fear' with a rise time of 1.0-3.0 seconds and 'Extended Fear' with a rise time 3.1-14.0 seconds. We shall now turn to the second variable, the mediation peak amplitude, which defines anxiety in terms of intensity in response to fear stimuli in a horror film clip.

Fear Stimuli (intensity)

Psychophysiology has no defined parameters to determine SCR levels of intensity, even though psychophysiological studies mention that high SCR amplitude values are significant (Boucsein, 2012). Dawson et al. 2009 argue that SCRs can be evaluated on variations in amplitude (Dawson et al. 2009), although amplitude has not been specifically mentioned in terms of intensity. This is a good reason to investigate SCR amplitude value in relation to intensity of a fear stimulus. For example, the highest SCR amplitude value would equate to an extremely high intensity level and the lowest SCR amplitude value to a low level of intensity. However, disparity between viewers'

SCR amplitude scores means that a comparison analysis between viewers can only be made by eliminating individual differences. This problem is illustrated in figure 3.9 which shows viewers 1 and 20 with their lowest SCR amplitude (above threshold 0.3µs) and highest. The graph reveals viewer 1 has a SCR peak amplitude range of 0.6831µs (difference) compared to viewer 20 with 1.7179µs. This informs us that it would be difficult to make a comparison between viewer 1 and 20 regarding anxiety intensity response to a fear stimulus because the significantly difference being 1.0388µs. The individual differences in SCR amplitude are mainly due to the physiological properties of the skin, for example the thickness of the stratum corneum (Dawson et al. 2009: 166).

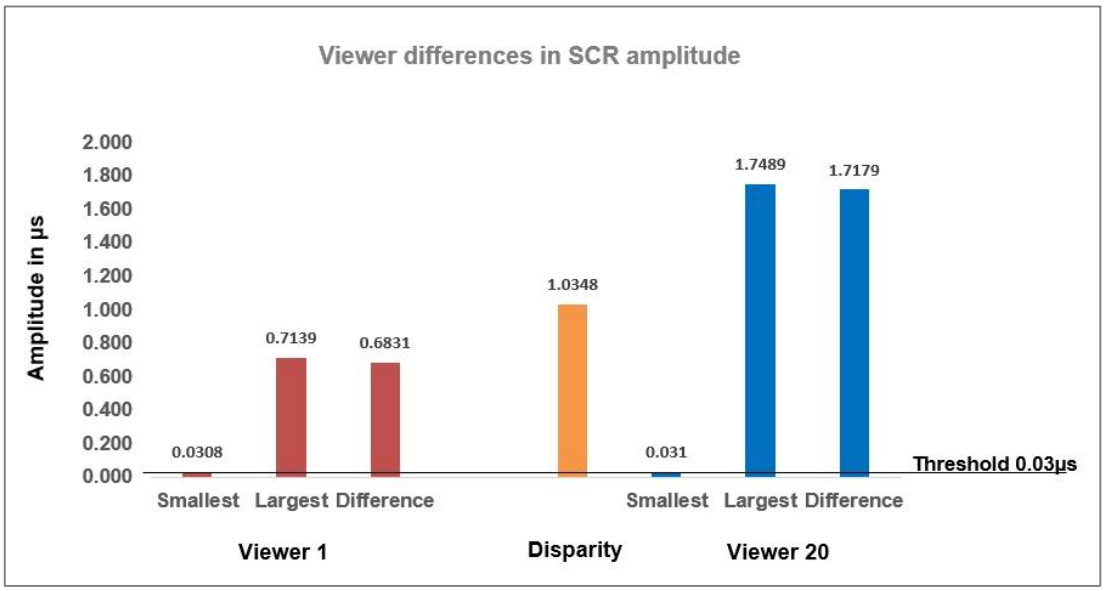


Figure 3.9. A bar chart showing the differences in SCR amplitude between viewer 1 and viewer 20.

According to Jason Braithwaite, Derrick Watson and Robert Jones we can resolve individual differences in SCR amplitudes through normalisation of the data so that all viewer amplitudes are standardised across the dataset. Wolfram Bousien recommends that normalisation of SCR amplitudes is best achieved by calculating z-scores for each SCR amplitude value. Z-scores are a statistical measurement of a viewer's SCR amplitude value and their relationship to the mean (average) of total viewer SCR amplitudes values. In order to do this, I created a list of total viewer SCR amplitude values in a Microsoft Excel spreadsheet across all film clips. The z-scores were then

calculated by first identifying the mean and standard deviation of total SCR amplitudes values for each viewer.

Z-scores for SCR values were calculated using the following formula:

Z-score = SCR amplitude – Total SCRs Mean (average) ÷ Total SCRs Standard Deviation

The z-scores provide a standardised measurement where 0 (zero) is the same as the mean, any fluctuations above (positive) or below (negative) the mean are shown in standard deviations. This is illustrated in figure 3.10, which shows a bar graph of viewer 27's SCR peak amplitude values that were elicited during the 8 film clips from the shared suspense narrative structure. *The Descent* (DE) shared suspense clip elicited the highest SCR amplitude peak with 1.0 standard deviation above the mean (0) and the *Silent House* (SH) shared suspense clip elicited the lowest SCR amplitude peak with -0.88 standard deviations below the mean (0). The green horizontal line in the graph represents the minimum threshold SCR amplitude peak in standard deviations, which is -1.0.

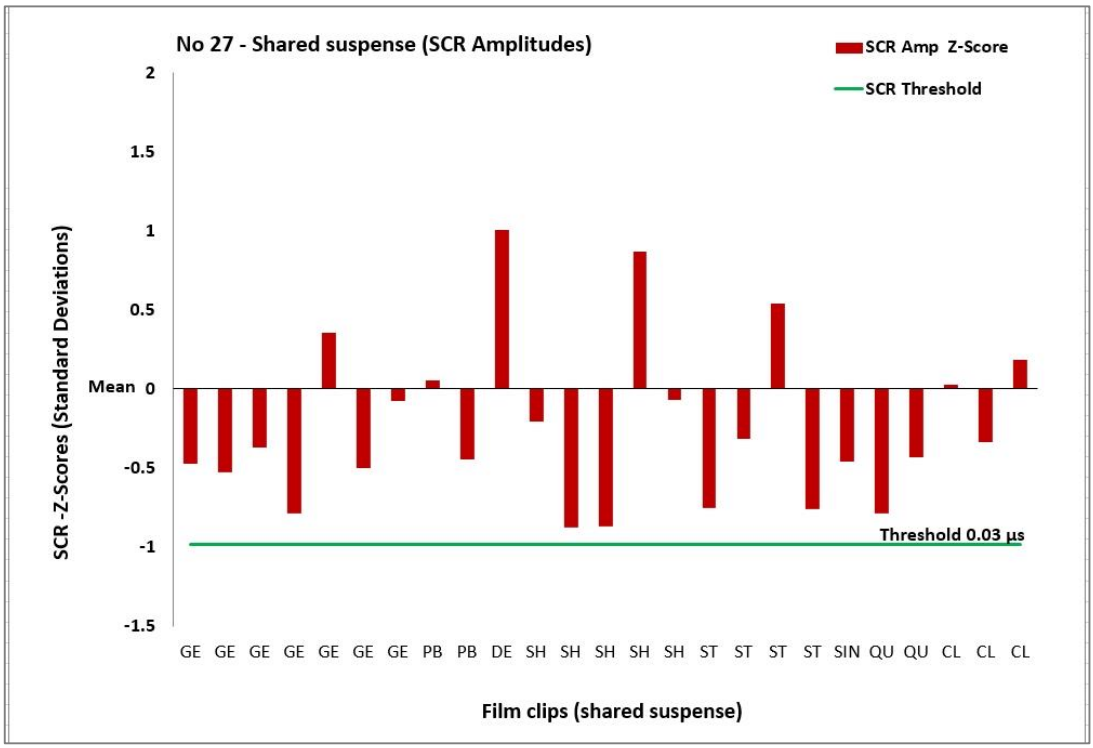


Figure 3.10. Viewer 27: SCR's transformed into z-scores and standard deviations below and above the mean (0 = zero).

The conversion of SCR amplitudes to z-scores provided the second anxiety variable, intensity on a scale of 1-4. Standard deviation at -1.0 is the weakest anxiety intensity level as it is in aligned with the minimum SCR amplitude threshold of 0.03µs. With only 1.8% of total SCR amplitudes across all viewers being higher than a 1.0 standard deviation meant that the scale of intensity by standard deviation could be set at four equal levels, each level being 0.5 standard deviations as shown in figure 3.11. Level 1, represents an extremely high level of anxiety (0.5-1.0 standard deviations), Level 2, a high level of anxiety (0.0-0.5 standard deviations), Level 3, a medium level of intensity (-0.5-0.0 standard deviations) and Level 4, a low level of intensity (-1.0-0.5 standard deviations). The four levels define viewer's anxiety intensity response to a fear stimuli in the film clips.

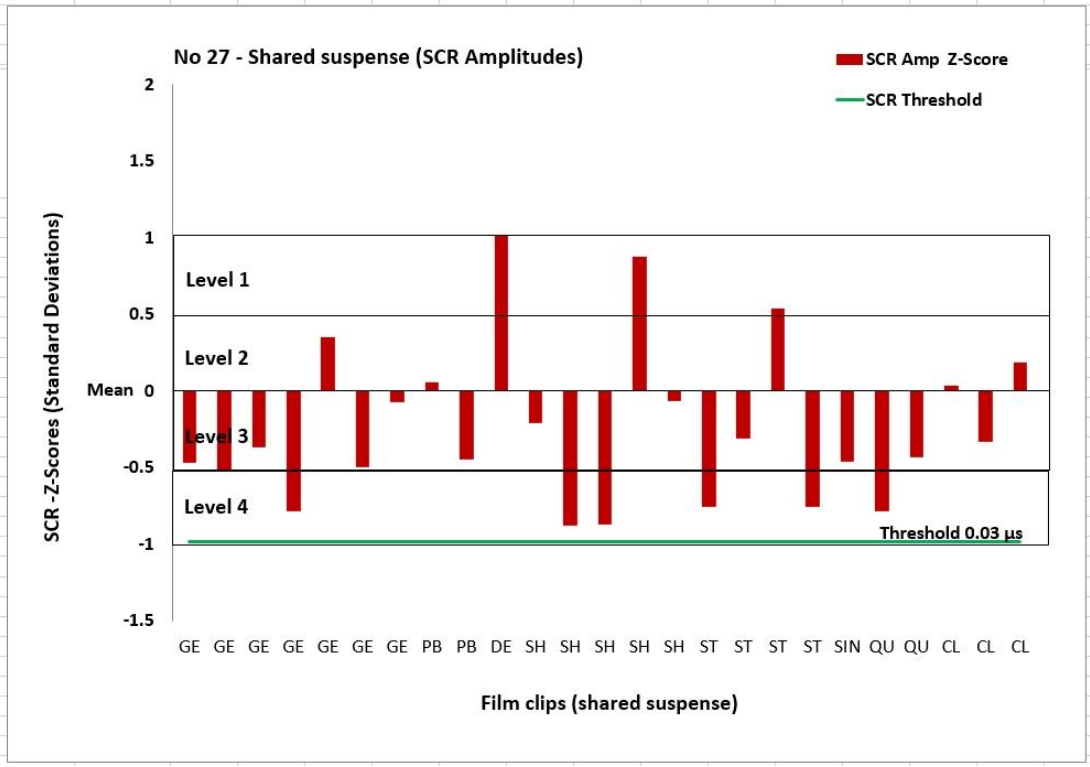


Figure 3.11. Viewer 27: Z-scores for shared suspense shown as four levels of intensity.

EDA Suspense Model Testing

The psychophysiological literature discussed in chapter 2 and previously in this chapter, regarding the importance of how a fear stimulus in a film clip elicits suspense as an anxiety response provides sufficient evidence to support the EDA model of

suspense. However, it was important to gain additional evidence by testing the proposed EDA model of suspense which measures an anxiety response through two variables, durability and intensity. In order to do this a predictability test was designed to see whether it was possible to predict the type of anxiety responses elicited during a film clip using textual analysis. The test was divided into parts: anxiety durability and anxiety intensity. In each test I estimated the 'expected viewer response'. For example, test 1A estimated viewers' anxiety durability response, which result could either be 'Momentary Fear' (1.0-3.0 seconds) or 'Extended Fear' (3.1-14.0 seconds). Test 1B estimated the level of anxiety intensity from a scale of 1-4. The first step was to select a sample of viewer mediation peaks, which would be used in both tests. In order to do this, I created a sample selection criteria based on narrative structure because vicarious, direct and shared suspense have specific definitions of suspense in terms of how the viewer is positioned with fictional characters in a film clip. The three narrative structures generated a sample of 549 mediation peaks, which is 52% of total mediation peaks from the film experiment. The main challenge for test 1A and 1B was predicting 'expected viewer responses' because viewers often respond differently to the same fear stimulus in terms of durability ('Momentary or Extended Fear') and/or level of intensity (1-4).

In an attempt to counter this problem I created a second sample of mediation peaks extracted from the sample of 549 mediation peaks. The selection criteria for the second sample was based on large clusters of mediation peaks that had the same rise time range and level of intensity by narrative structure (vicarious, direct or shared suspense) and film clip. For example 'Momentary Fear' (1.0-3.0 second duration) with Level 4 intensity scored highest for shared suspense across all film clips with 87 mediation peaks compared to direct 48 and vicarious 34. The film clips that generated the largest group of mediation peak clusters for 'Momentary Fear' level 4 included *Grave Encounters 2* with 17, *Silent House* 16, *The Strangers* 14 and *Sinister* 12. Although selecting mediation peak clusters in this way reduced the sample from 549 to 235, it was important to focus on cluster sizes of mediation peaks in an attempt to reduce individual difference between viewer mediation peaks to a fear stimulus. Therefore

the test was conducted with 22.3% of the total mediation peaks from the film experiment.

The next stage was to ensure the spreadsheet used in the test had the following information: film clip, narrative structure and latency start time for each mediation peak. With this information available for the test I could match the latency start time to a specific stimulus in a film clip and would be able to assess what happened in the film clip before a fear stimulus triggered a mediation peak. The sample of mediation peaks were given a number of 1-235 and randomised creating a new mediation peak order sequence. This was to make it more challenging to predict 'expected viewer responses' because mediation peak clusters would be distributed across the entire sample rather than being viewed together in a film clip.

Test 1A: Estimating Anxiety Durability

The purpose of test A was to predict the 'actual rise time range' for each a mediation peak from the 235 mediation peak sample. To assist in my decision to predict the 'actual rise time range' for each mediation peak I used textual analysis to find moments where I assumed would lead to elicit a 'Momentary Fear' rise time range (1.0-3.0 seconds duration) or 'Extended Fear' rise time range (3.1-14.0 seconds duration). I then combined these story assumptions with the basic information about each mediation peak that was compiled on a Microsoft Excel spreadsheet, which included the following: Film name (e.g. *Silent House*), narrative structure (vicarious, direct and shared) and the time during the film clip when the mediation peak occurred. When assessing each mediation peak I also analysed the film clip by story assumptions, the construction of the narrative structure, cinematic elements and the story information before the elicitation of mediation peak and the fear stimuli the triggered the mediation peak. 'Momentary Fear' was designated with the number 1.0 and 'Extended Fear' with number 2.0. This meant that when I thought a mediation peak was a 'Momentary Fear' response I would score it 1.0 and if 'Extended Fear' response 2.0.

Four story assumptions were matched to each rise time range 'Momentary Fear' and 'Extended Fear'. For example fear stimuli of footsteps with a low level of sound intensity and low pitch or a bright light source shown in the distance then this would be characterised as a 'Momentary Fear' response, a condensed anxiety response. This is because the fear stimulus is not necessarily presenting an immediate danger to a protagonist compared to very loud footsteps with high loudness which can be perceived by the viewer as being very close to the protagonist and viewer, resulting an in immediate threat. I would score a mediation peak with 1.0 ('Momentary Fear'), a condensed form of anxiety, if the following story elements occurred in a film clip:

'Momentary Fear' (1.0) Story Assumptions

1. A popular film making technique that is likely to elicit a strong anxiety response can be achieved through close up or extreme close ups of the protagonists face when they experience pain or suffering. This is because the viewer picks up on their emotional state through the facial expressions (Caes et al. 2012: 476; Kydd, 2011: 120). With a 'Momentary Fear' response indicating a brief anxiety response it seemed plausible to select a story context where the protagonist's emotional state is hidden from the viewer. This would mean no close ups or extreme close ups of the protagonist face were shown or where the protagonist did not display any facial expressions of fear.
2. Off-screen sounds, such as the antagonist's footsteps heard in the distance that have low sound loudness, giving the impression that the antagonist is a long distance away from the protagonist and so does not pose an immediate threat.
3. When the protagonist makes a decision that appears to be illogical, such as placing themselves in more danger when it is easier to escape.
4. The antagonist is off-screen or when narrative and cinematic elements shown on screen do not appear to be threatening to the protagonist.

I would score the mediation peak with 2.0 ('Extended Fear'), a prolonged form of anxiety, if the following story elements occurred in a film clip:

'Extended Fear' (2.0) Story Assumptions

1. Watching a close up/extreme close up of a protagonist who is in a state of terror revealed through their facial expressions of fear.

2. An unexpected off-screen sound from an inanimate object that creates a high level of loudness with a low or high pitch, such as metallic objects or footsteps with a high level of loudness and low pitch that could trigger a longer anxiety response.
3. The viewer is aware that the protagonist's life is about to be threatened and the protagonist is oblivious to any danger.
4. When the protagonist is frightened in the dark, isolated or trapped with an antagonist threatening their life

By structuring the predictability test A in this way provided a realistic possibility of achieving a match between the story assumptions and mediation peak rise time range, even though some viewers may respond differently to the same fear stimulus.

Results Test 1A: Estimating Anxiety Durability

The results were promising with a predicted 'expected rise time range' match to 182 mediation peak responses from 235 mediation peaks. This means that using the story assumptions enabled me to predict correctly mediation peak rise time ranges with a 77.4% success rate. I then created a scatter plot graph which shows 'actual rise time range' and 'expected rise time range' in blue dots. The errors for 'Momentary and Extended Fear' are shown inside black boxes in the scatter plot graph in figure 3.12. To find out whether there was a statistical correlation between 'expected rise time range' and 'actual rise time range' I used the descriptive statistic Pearson's coefficients of correlation (*P*). This statistical measurement determines the strength of a correlation between two variables (Goodwin, J & Goodwin, K. 2014), in this instance that is between 'expected rise time range' and 'actual rise time range'. According to James and Kerri Goodwin, correlations can be positive or negative, for example a positive correlation is when the high score of variable 1 ('expected rise time range') is associated with the high score of the variable 2 ('actual rise time range') and the low score of a variable 1 ('expected rise time range') is associated with the low value of variable 2 ('actual rise time range'). A negative correction is when the high score of variable 1 is related to the low score of variable 2 and the high score of variable 2 is related to the high score of variable 1. The coefficients of correlation (*P*) value for an optimum positive correlation is +1.0 and a negative is -1.0. A value of 0 means there

is no correlation between the two variables (Goodwin, J & Goodwin, K. 2014: 280-281).

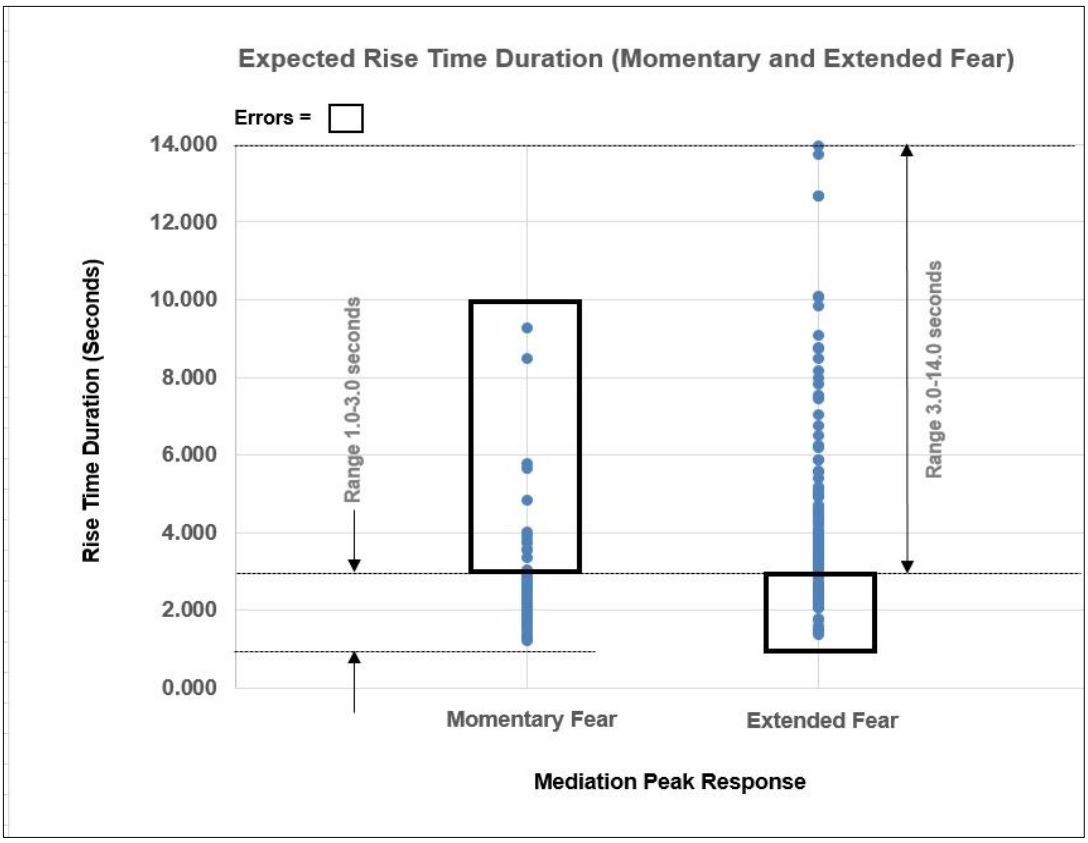


Figure 3.12. Predicting expected rise time with errors shown in black boxes.

With the 'expected rise time range' in the test being scored as 1.0 for 'Momentary Fear' and 2.0 for 'Extended Fear' before calculating the coefficients of correlation I created a new column in the Microsoft Excel spread sheet where I converted the actual rise time duration in seconds to a numerical value of 1.0 for a 'Momentary Fear' response and 2.0 for an 'Extended Fear' response. With the 'expected rise time range' and 'actual rise time range' converted into the same numerical values the calculation of the coefficients of correlation could be completed. The result for 'expected rise time range' was *P*= 0.62, which indicates there was a positive correlation between 'expected rise time range' and 'actual rise time range'. Test 1A informs us that viewer rise time range can be estimated based on the mediation peak sample selection criteria and by story assumptions based on specific story elements and the type of fear stimulus.

Test 1B: Estimating Anxiety Intensity Levels 1-4

Test 1B was a repeat of test 1A except test 1B predicted mediation peak 'expected level of intensity' which had 4 possible choices: 1 (extremely high), 2 (high), 3 (medium) and 4 (low). Using the same mediation peak sample in test 1A and assumptions regarding story elements and type of fear stimulus. I scored each mediation peak with numerical values of 1.0. 2.0, 3.0 or 4.0 which represent the 4 different levels of anxiety intensity. The story assumptions made in test 1 A were matched to the different levels of intensity. For example I would score a mediation peak with an anxiety intensity level of either 1.0 or 2.0 based on the story assumptions for an 'Extended Fear' response and levels 3.0 or 4.0 based on the story assumptions for a 'Momentary Fear' response.

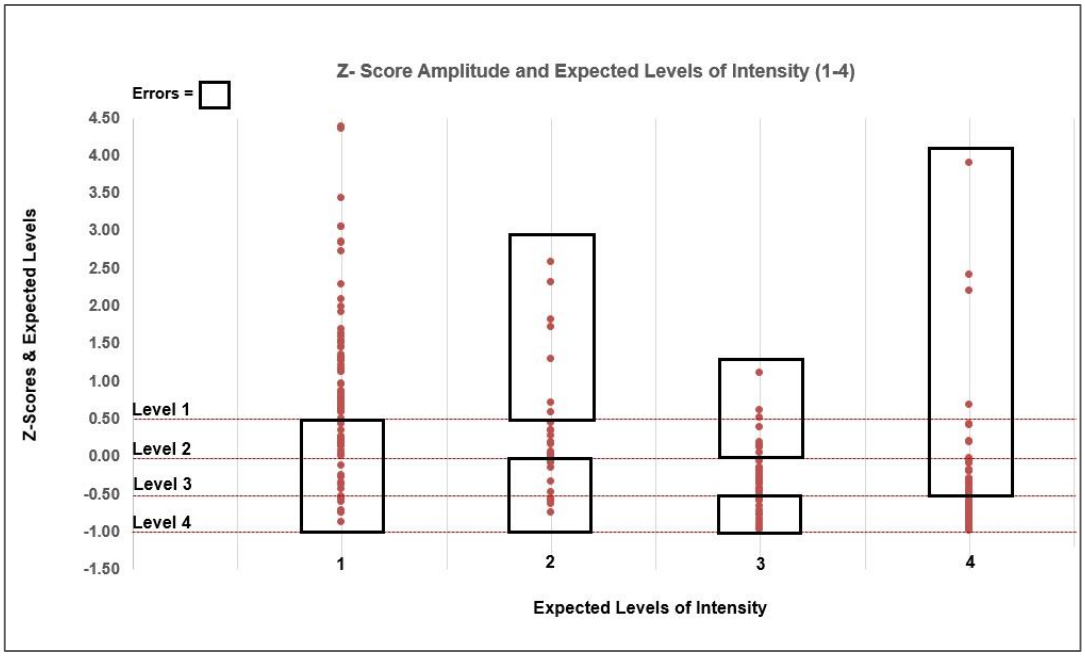


Figure 3.13. Predicted levels of intensity (1-4) with errors shown in the black boxes.

Results Test 1B: Estimating Intensity Levels 1-4

It was anticipated that test 1B would produce a lower score and *P* value than test 1A because test 1B had a 1 in 4 chance of matching 'expected level of intensity' with 'actual level of intensity', compared to a 1 in 2 chance in test 1A. Even so the results in test B were positive with the 'expected level of intensity' score being 139 from 235 mediation peaks, a 59% success rate. I then inserted a column in the Microsoft Excel spreadsheet to convert the numerical value of a z-score to the level of intensity 1-4.

For example if the z-score was 1.5 standard deviation above the mean (0) the input level would be 1.0 intensity. The errors for intensity levels 1-4 are shown inside black boxes in the scatter plot graph in figure 3.13.

The Pearson correlation between 'expected level of intensity' and 'actual level of intensity' was P=0.65, which indicates a positive correlation between the two variables. The results of tests 1A and 1B provided evidence that it is possible using the EDA model of suspense to estimate 'rise time range' in terms of the anxiety durability of a fear stimulus ('Momentary and Extended Fear') and anxiety through four levels of anxiety. The discussion will now turn to the analysis of mediation peaks by type: 'Momentary Fear' and 'Extended Fear' responses. This means that identifying significant groups (clusters) of either 'Momentary Fear' or 'Extended Fear' responses with the same intensity level that are matched to a specific fear stimulus in a film clip are more likely to produce tiny clusters of 2-3 mediation peaks.

Mediation peaks: 'Momentary Fear' and 'Extended Fear' Responses

The 'Terror & Tension' film experiment generated 1055 mediation peaks across all film clips, with 630 'Momentary Fear' responses (60%) and 425 'Extended Fear' responses (40%). The fact that 'Momentary Fear' had 15.2% more responses than 'Extended Fear' indicated that suspense was predominantly generated by a condensed form of anxiety across the experiment. However, with 40% of responses being 'Extended Fear', the dataset indicated that a large proportion of viewers also reacted with a prolonged form anxiety during the film experiment. This informs us that some fear stimuli in the film clips elicited a sustained anxiety response which would have not been identified using the classified 1.0-3.0 second rise time range. These demonstrates that by eliminating 'Extended Fear' responses that has a rise time range exceeding 3.0 seconds from the film experiment would produce misleading conclusions about viewers EDA experience of suspense.

'Momentary Fear' and 'Extended Fear' Response by Levels of Intensity

When comparing 'Extended Fear' and 'Momentary Fear' level 1 responses (extremely high anxiety intensity), 'Extended Fear' level 1 responses scored the highest with 148

(14%) of total mediation peaks from the experiment compared to 'Momentary Fear' level 1 with 69 (6.5%) (Figures 3.14 and 3.15). With 'Extended Fear' level 1 recording a 7.5% higher score than 'Momentary Fear' level 1 indicates that viewers were more likely to experience a prolonged form of anxiety with the highest level of intensity than a condensed form of anxiety. This informs us that viewers reacting with an 'Extended Fear' level 1 response to a fear stimulus in a film clip were more likely to experience the strongest form of suspense.

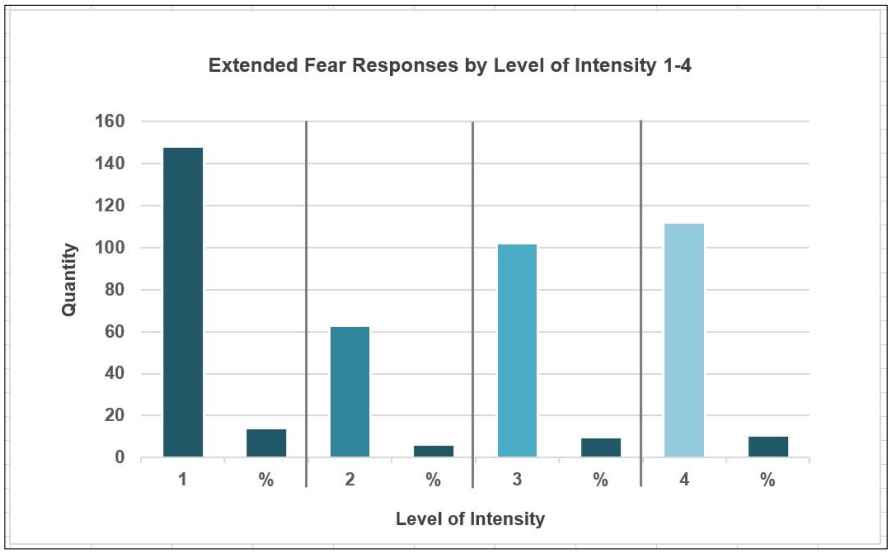


Figure 3.14. Quantity of 'Extended Fear' responses by 4 levels of intensity.

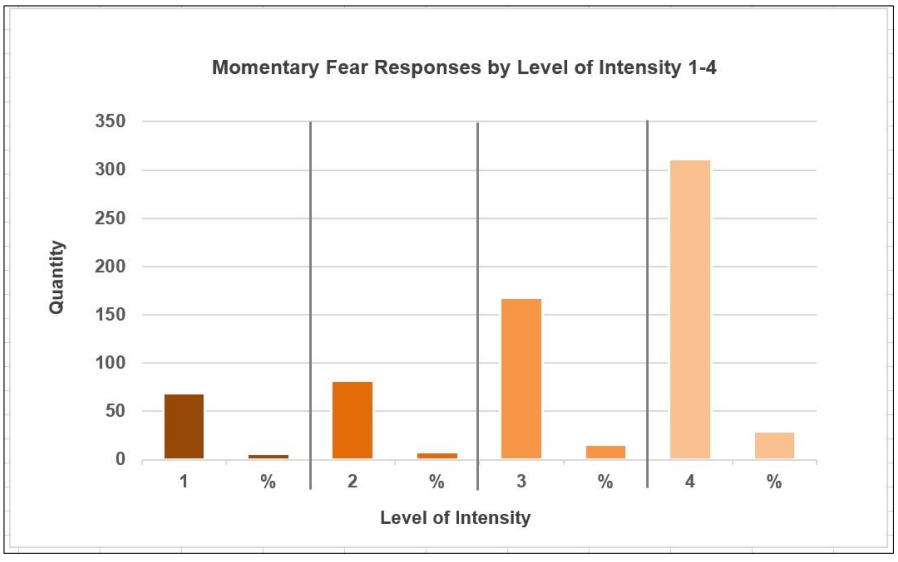


Figure 3.15. Quantity of 'Momentary Fear' responses by 4 levels of intensity.

Turning to identifying the weakest form of suspense based on anxiety levels of intensity 'Momentary Fear' level 4 accounted for 311 (29.4%) of total mediation peaks for the film experiment compared to 'Extended Fear' level 4 with 112 (10.6%). These findings inform us that 'Extended Fear' responses were less likely to occur at the lowest level of intensity compared to 'Momentary Fear' level 4. From the total of mediation peaks from the film experiment 'Momentary Fear' responses by level of intensity elicited the following: level 1 produced 6.5%, level 2 (7.8%), level 3 (15.9%) and level 4 (29.5%). With nearly a third of total mediation peaks being 'Momentary Fear' level 4 responses, this demonstrates that when viewers reacted with a 'Momentary Fear' response they were more likely to experience a condensed anxiety response at the lowest level of intensity. Whereas from total mediation peaks from the experiment 'Extended Fear' level 1 responses produced 14.0%, level 2 (6.0%). Level 3 (9.7%) and level 4, (10.6%) which demonstrates that when viewers respond with an 'Extended Fear' response they were more likely to experience a prolonged anxiety response at the highest level of intensity.

These findings by anxiety level of intensity (1-4) illustrate a pattern of how these two types of mediation peaks elicited suspense during the film experiment. For example, 'Extended Fear' responses were more likely to produce the highest level of anxiety intensity and 'Momentary Fear' the lowest level of anxiety intensity. This is the reason why 'Extended Fear' level 1 responses are important in detecting the strongest anxiety response, demonstrating that the viewer responds with a prolonged anxiety response at an extremely high level of intensity. Moreover 'Extended Fear' levels 1-2 responses accounted for 20% of total mediation peak responses compared to 'Momentary Fear' levels 1-2 with 14.3%. 'Extended Fear' level 1-2 responses are of particular interest because they present a stronger form of suspense in terms of anxiety durability. We shall now turn to viewer mediation peak response by narrative structure.

Viewer Mediation Peaks by Narrative Structure

Composite suspense elicited the highest quantity of mediation peaks with 408 (38.8%), followed by shared 318 (30.3%), direct 178 (16.9%) and vicarious suspense with 148 (14%). Initially these findings appear to indicate that composite suspense

was more successful in eliciting mediation peak responses and vicarious suspense was least successful. However, these figures are based on a relationship between quantity of mediation peaks and duration of all film clips for each narrative structure, rather than demonstrating how successful the fear stimulus in individual film clips were at eliciting mediation peaks.

For example when we consider that each narrative structure contains 8 film clips, composite suspense had the longest duration lasting 490.0 seconds, followed by shared 350.0 seconds, direct 164 seconds and vicarious 92 seconds. When calculating the mediation peak frequency based on duration for each narrative structure vicarious suspense produced the highest frequency with 1.64 mediation peaks per second. Direct suspense came second with 1.08, shared with 0.90 and composite with 0.80. This tells us that the shorter narrative durations of the vicarious and direct clips produced a higher frequency rate of mediation peaks than the longer film clips of shared and composite suspense. One reason why vicarious and direct suspense produced a higher frequency of mediation peak responses is that shorter film clips have a more condensed threatening stimulus within the story context than the longer narrative structures of shared and composite suspense. Consequently, vicarious and direct narrative structures potentially are more likely to produce a rapid form of suspense compared to shared and composite suspense. We shall now turn to a comparison analysis of mediation peaks between vicarious, direct, shared and composite suspense.

Distribution of Mediation Peaks by Suspense Narrative Structure

Vicarious suspense scored the highest 'Extended Fear' responses with 48.6% compared to shared 42.7%, direct 39.8% and composite at 35.7%. This indicates that vicarious suspense generated the highest percentage of 'Extended Fear' responses even though the narrative structure had the shortest duration. Composite suspense, with the longest duration and most mediation peaks, scored the least 'Extended Fear' responses. This demonstrates that vicarious suspense is more likely to elicit a prolonged form of anxiety compared to shared, direct and composite suspense. We shall now turn to mediation peak durability and level of intensity, focussing on the

strongest form of suspense (‘Extended Fear’ Level 1) and the weakest form of suspense (‘Momentary Fear’ level 4).

Distribution of ‘Extended Fear’ level 1 Responses by Narrative Structure

Vicarious suspense produced the highest quantity of ‘Extended Fear’ level 1 responses with 21% followed by shared 14.1%, composite 12.5% and direct suspense 11.2%. Vicarious suspense also had the lowest percentage of ‘Momentary Fear’ level 4 responses at 23.8%, compared to composite 29.4%, shared 30.5% and direct suspense 32.5%. Based on these findings vicarious suspense was less likely to produce a condensed form of anxiety at the lowest level of intensity compared to direct, shared and composite suspense. These findings also indicate direct suspense produced the weakest form of suspense because they generated the least ‘Extended Fear’ level 1 responses and the highest ‘Momentary Fear’ level 4 responses. We shall now turn to viewer verbal feedback comments that were recorded after watching the film clips.

Viewer Feedback

Viewer feedback comments provided an insight into their subjective experience and contextualised the fear stimuli that are presented during the film clips, such as narrative elements and cinematic techniques through camera angles, shots, lighting, sound or the actor’s performance through reading the characters’ facial expressions, vocal sounds and body movement. Viewer feedback comments in this context are valuable because the information viewers provide cannot be attained from viewer mediation peak responses. Therefore viewer feedback comments contextualise viewers’ conscious experience of fear stimuli in the film clip while viewer mediation peaks provide a measurement of viewers’ unconscious anxiety responses to fear stimuli in terms of durability and intensity. Combining viewer comments, mediation peaks and textual analysis provided a holistic approach to defining suspense in horror film clips.

However, with viewers being given 30.0 seconds to provide instinctive feedback, each film clip presented viewers with the challenge of articulating their experience of a film clip in a short time frame. This meant that viewer feedback could have inaccuracies in

respect of what happened in the film clip or involve only a short sentence to describe a viewer's experience. For example, viewer 20 (male) reacted with 3 'Extended Fear' level 1 responses during the film clip *Quarantine* vicarious suspense which means he experienced a sustained prolonged anxiety response at an extremely high level of intensity. However, his feedback comments about the film clip were brief: 'The fact that she could not actually see what was happening, but she could only hear it... and the night vision camera really makes it'. Although his comments tell us about narrative, sound, lighting and hints at cinematography his comments are brief and are quite limiting. The key challenge in regarding viewer feedback comments and mediation peaks is ensuring they work together to provide an integrated understanding of viewers experience of suspense in horror films.

It is unlikely that viewer feedback comments will describe a specific fear stimulus that elicited a mediation peak response. This is because mediation peaks are involuntary unconscious physiological changes to a fear stimulus that is matched to a mediation peak by the millisecond during a film clip. The findings from the film experiment also found viewers can react with 1-8 viewer mediation peaks when watching a short film clip which makes it difficult to pinpoint fear stimuli with their feedback if they only mention one fear stimulus that elicited suspense. As mentioned earlier, viewers are unlikely to recall everything from a film clip let alone being aware of a specific narrative element or cinematic technique that elicited a mediation peak response. For example, a viewer may provide a comment about their empathy for the protagonist based their facial expressions of fear during the film clip, however the viewer will not know which frame of the film clip triggered suspense or what was happening in the frame in terms of other narrative elements and cinematic techniques.

Another issue is that viewers are more likely to comment on fear stimuli that startled them, especially if this happened at the end of a film clip. This is because a startle stimulus will tend to stand out more than other subtle changes that act as fear stimuli in constructing suspense, such as low-key lighting that creates dark shadows, cueing the viewer about possible unknown dangers that lurk in the dark. An example of a fear stimulus eliciting a strong anxiety response but not appearing in viewer feedback

comments can be provided by the *Sinister* direct suspense clip. During this film clip the viewer has the point-of-view of the antagonist who has been stalking a family in their home, watching them through a hand-held camera. At 23.5 seconds, the antagonist enters an outside gate and then the family's home, generating a fear stimulus. Viewer 6 (male) reacted with an 'Extended Fear' level 1 response (Figure 3.16). This indicated that this fear stimulus triggered a prolonged anxiety response at the highest level of intensity. However, towards the end of the film clip (56.3 seconds) the viewer watches the antagonist pushing a lawnmower along the grass, when suddenly the lawnmower approaches a person lying on the ground and the lawnmower is about to run over their face (Figure 3.17).

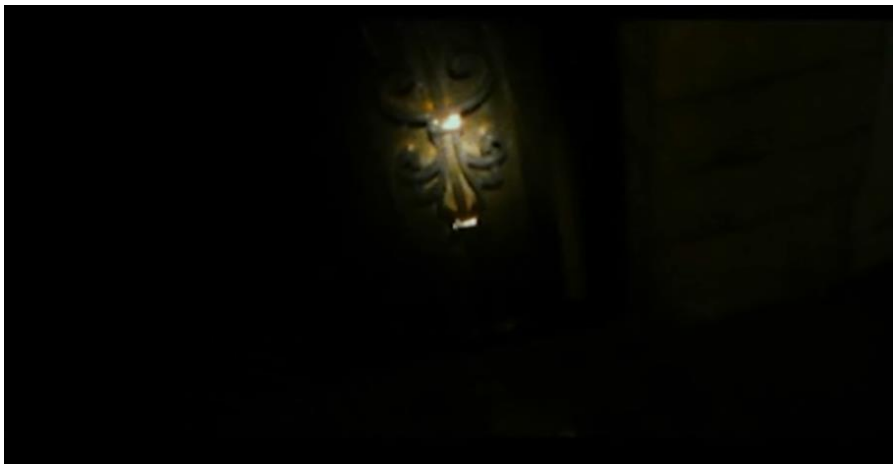


Figure 3.16. At 23.5 seconds viewer 6 reacts with an 'Extended Fear' level response.



Figure 3.17 At 56.3 seconds the lawnmower is seen approaching a person lying on the grass with the intention of running over the persons face.

The lawnmower startle fear stimulus was at the centre of viewer 6's feedback comments and he did not mention the film sequence when the antagonist approaches and opens the external gate to gain access into the house and family, as he explains:

> Well, this looks like the stalker at first is stealing a lawnmower. It doesn't look like anything that much. But at the end, when the sudden sound, I think the sound like makes me feel frightened at first, at the last before the image come up (viewer 6).

The reason why viewer 6 mentions the startle stimuli is because the sequence was unexpected, shocking to watch and would be fresh in his mind when providing an instinctive feedback response only seconds afterwards. However the startle stimuli did not elicit a mediation peak which tells us why mediation peak responses are important for analysing the viewing experience of suspense. They can pinpoint exactly what triggered a fear response in terms of narrative elements and cinematic techniques. The EDA model of suspense also provides a detailed understanding of the viewer's anxiety response to a fear stimulus in terms of durability and intensity. Therefore the 'Extended Fear' level 1 response at 23.5 seconds informs us that viewer 6 experienced the strongest anxiety response when the antagonist approaches the external gate to gain access to the house and family rather than the startle stimulus of the lawnmower. This heightened moment of suspense is also supported by textual analysis because the antagonist's approach to the gate cues the viewer that the antagonist will more likely attack and kill the family inside the house.

Finally, the decoupling of viewer comments and mediation peak responses can occur when viewers say they were scared but their EDA data did not indicate a mediation peak response. This concerns issues related to viewers' EDA signal responses in two ways. Firstly, these viewers may have experienced an increase in their skin conductance level (SCL) rather than eliciting a mediation peak response to specific fear stimuli in a film clip. As mentioned previously, although SCL has been used in psychophysiological studies to determine fear and suspense when watching film clips, it is problematic to match with specific fear stimuli during short film clips and because of a distortion in the EDA signal creating skin conductance level (SCL) drift. Secondly, the thickness of the stratum corneum (top layer of the skin) can impede the

process of sweat contacting the electrodes and is one of the reasons why there are individual differences in viewer EDA amplitude ranges.

However, viewer feedback is essential because in the majority of cases viewer feedback comments contextualise their experience of the film clip and add additional information that also supports the viewer's mediation peak responses. For example, in *The Strangers* (vicarious suspense) an antagonist wearing a mask suddenly appears at the window of a shed, accompanied by a threatening sound. The antagonist looks in the direction of protagonist Kristen McKay (Liv Tyler) who is not aware that the antagonist is standing close by (Figure 3.18). Instead Kristen is busy talking on a radio transmitter seeking help because she and her boyfriend James Hoyt (Scott Speedman) have been attacked in their house. During this film sequence, viewer 16 (male) reacted with a 'Momentary Fear' level 1 response and explains what stood out most to him about the film clip:

> That was really scary. That weird thing that appeared right there, with the mask. And from the voice of the girl that makes me feel even more scared, because I could feel the fear in her voice. And her expression showed a lot of fear as well. That makes me feel really scared. And the music, the music increased the suspense of that film (viewer 16).



Figure 3.18. At 2.1 seconds viewer 16 reacts with a 'Momentary Fear' level 1 response.

Viewer 16's comments provide a detailed description of what scared him most such as the antagonist mask, threatening sound (music) and the fear in Kristen's voice when she attempts to call for help. This mixture of fear stimuli match viewer 16's 'Momentary Fear' level 1 response, creating a condensed anxiety response at an extremely high level of intensity. Viewer 16 comments inform us how mediation peak response can be aligned with and viewer feedback comments creating a deeper insight in to understanding the viewing experience of fear stimuli and the construction of suspense in horror films compared to just using a textual analysis approach. The discussion will now analyse popular keywords concerning narrative elements and cinematic techniques that viewers describe as being most frightening and how they described a fear stimulus.in the film clips from the film experiment.

Viewer Keyword Analysis

When considering viewer comments as a whole and across all film clips 85.6% of viewer comments mentioned that they experienced some form of anxiety response ('tension', 'anxious', 'suspense' 'scared') to a fear stimulus in the film clips. This demonstrates that the film clip selection based on Susan Smith's narrative model of suspense was effective in eliciting suspense in horror films through different narrative structures: vicarious, direct, shared and composite suspense. All viewer feedback comments were transcribed into a word document for data analysis to identify keywords that describe narrative elements or cinematic techniques that made viewer feel suspense or scared. When considering how viewers expressed their response to a fear stimulus in terms of suspense, participants used terms such as 'anticipation', 'tension', 'nervousness' and 'anxiousness'. To simplify the analysis, the quantity of viewer comments that mention the four antecedents of suspense were merged into the keyword 'suspense'. Words used to describe a fear response included 'creepy', 'frightened' and 'scared'. With the word frightened and scared being similar in their meaning and scared being the most popular word, the quantity of viewer comments that mention the word frightened was merged with the keyword scared.

The three most popular keywords to describe a fear response from the film clips in the experiment, generated 586 comments with the word 'scared' having the highest score

with 265 (45.2%) followed by 'suspense' with 221 (37.7%) and 'creepy' with 100 (17.0%). This indicates that viewers described a fear response to a fear stimulus in the film clips in three different ways. Although horror films heavily rely on scare moments which often occurs through a startle stimulus, these findings indicate that the construction of suspense plays an important role in the horror films as well as viewers feeling scared, even though the films clips were between 1.0-90.0 seconds in duration. The discussion will now explore each keyword that describe a fear stimulus in terms of the formal components of the film clip. The most popular keywords to describe the textual features that generated a fear response fell into the broad formal categories of cinematography, sound and mise-en-scène. For example, 'cinematography' included references to the camera angle or type of camera such as night-vision, lighting: (e.g. camera flashes of light in *Silent House* direct suspense), sound (diegetic and non-diegetic), and mise-en-scène (stage props). There were 589 keywords used that described a specific cinematic technique that elicited a fear response in viewer comments across all film clips. Sound was the most popular cinematic technique with 214 (36%) followed by lighting with 146 (25%), camera 115 (20%) and stage props with 114 (19%).

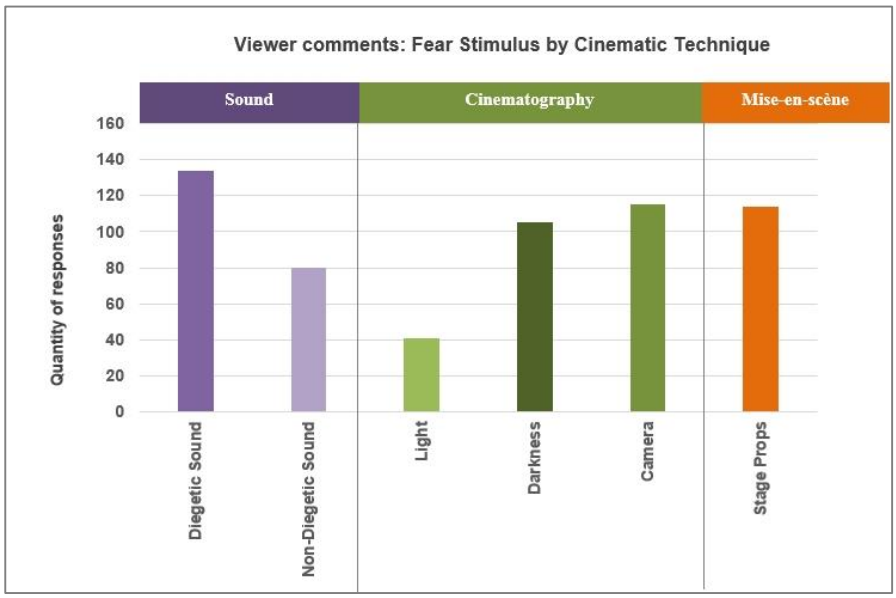


Figure 3.19. Viewer keywords by quantity from feedback comments that relate to cinematic techniques.

This informs us that viewers felt that sound played a dominant role in the construction of suspense and a fear response. This view is supported by Peter Hutchings who said '…horror is primarily a sound-based medium' (Hutchings 2004: 128). When analysing the two different types of sounds in films, viewer comments indicate that diegetic sounds (part of the story world) produce the most viewer comments with 133 (23%) compared to non-diegetic musical scores with 79 (19%). The diegetic sounds included character dialogue (e.g. antagonist groans and protagonist whimpering cries), and off-screen sounds that don't have a visual source on screen, such as metal objects, footsteps and satanic chanting and will be discussed further in chapter 5. Lighting was the second most popular cinematic technique mainly because night-vision cameras were used in many of the film clips. Other forms of lighting that were mentioned by viewers included the shaft of natural light entering a dark cave from the planet's surface in *Pitch Black* shared suspense and Polaroid camera flashes of bright light in contrast with dark shots of a black screen in *Silent House* direct suspense. When we take into consideration the differences in lighting, in particular between a bright light source and complete darkness, a bright light source was less popular with 41 (7%) of viewer comments compared to darkness with 105 (18%). This indicates that viewers were more likely to experience the construction of suspense or a fear response when they watch a film clip in darkness than when brightly lit. This is because the dark natural triggers our fear of the unknown in horror films (Eitzen, 2010) and because the dark conceals narrative information from the viewer and/or protagonist such as the antagonist hiding in the dark.

Different camera angles and shots played an important role in the construction of suspense. A good example of how a viewer recognises the way in which cinematography constructs suspense is well articulated by viewer 5 (female) as she explains how the camera constructs suspense in *Pitch Black* vicarious suspense:

> I think again, it's that camera angle, where you're sort of looking up at the person, and then you can see something moving in the background that's sort of creepy like tentacles. And, because of the way it's shot, you know that the person you are looking at can't see it. So it makes you really tense because you're just sort of sitting there going: 'Turn around, it's right behind you.' And obviously there's kind of like that

> creepy, eerie, silently sound again. And then when it suddenly flashes past (viewer 5).

Viewer 5 describes a low angle camera shot as it looks upwards towards the protagonist and that a creature is seen in the background within the same frame and the way its shot denies information to the protagonist. This example illustrates how viewers recognise the important role camera angles play in the construction of suspense in horror films.

The most popular stage props that viewers mentioned was a mask covered an antagonist face in the film *The Strangers*. The majority of viewers said they were scared of masks because they hide a person's facial expressions so they cannot see what they are feeling. Viewer 5 (male) explains:

> I think the masks were really noticeable, because it's always people in masks are always much scarier than when you can see their faces. If you don't know what's behind the mask. And it's just a well-known tactic to scare people (viewer 5).

Viewer 5's comments reveals the mask conceals the identity of the antagonist and what is behind the mask that could scare him. He also refers to the antagonist wearing a mask in a horror films are commonly used to scare viewers. This indicates that his fear response to the mask is driven by his expectations of something scary.

Conclusion

This chapter proposes an EDA model of suspense to measure viewer experience of suspense in 21st century horror films, in terms of anxiety durability and intensity. Evidence to support the EDA model of suspense was achieved in the following three ways: firstly, a theoretical framework to measure suspense was developed using the literature from film studies and media psychology. This led to defining the mediation process of suspense as an anxiety response to fear stimuli. Secondly, the literature in psychophysiology led to the development of two types of skin conductance responses (SCR) based on rise time ranges (mediation peaks), that determine anxiety durability ('Momentary Fear' and 'Extended Fear'). Both mediation peaks were also defined by their amplitude in terms of anxiety intensity. Thirdly, the EDA model of suspense was tested to see whether textual analysis could predict what type of mediation peak was

elicited during a film clip, in terms of anxiety durability ('Momentary Fear' and 'Extended Fear' responses) and anxiety intensity (levels 1-4).

The EDA model of suspense was developed in three ways, firstly, quantitatively, through EDA data sets and mediation peak responses identifying viewers' anxiety response in terms of durability and intensity level to specific fear stimuli in the film clips. Secondly, qualitatively, with viewer feedback comments contextualising the viewer's subjective experience of how horror films construct suspense in terms of narrative elements and cinematic techniques. Thirdly, textual analysis to contextualise suspense filmmaking conventions through narrative and cinematic techniques. However, in order to bring these three lines of enquiry together to understand viewer's experience of suspense, it was essential to draw on best practice from film studies and media psychology two disciplines that take different approaches to data analysis. Firstly, film studies provide a qualitative approach using textual analysis of narrative elements and cinematic techniques. Secondly, methods from Human Computer Interaction (HCI) and psychophysiology to capture quantitative data using psychophysiological recording to identify the invisible data channel of viewers' unconscious responses to fear stimuli presented in the film clips. This was carried out using EDA, which is the most appropriate psychophysiological technique to measure viewer response to a fear stimulus in horror film clips. Thirdly, psychology regarding experimental design of the 'Terror & Tension' film experiment and capturing of qualitative data through viewer feedback comments. Also descriptive statistical analysis was used to define the number of participants who took part in the film experiment, to identify individual differences in EDA data sets and data analysis to validate the EDA model of suspense.

This mixed methods approach to the analysis of the film experiment enabled the development and validation of the EDA model of suspense, which provides a new understanding for film studies, media psychology and psychophysiology in determining the construction of suspense in horror films using EDA data sets. In particular, measuring the relationship between viewer anxiety responses (suspense) to fear stimuli using two *phasic* skin conductance response rise time ranges (anxiety

durability) and four levels of anxiety intensity (skin conductance response amplitudes). Gaining further evidence to validate the EDA model of suspense was achieved through a testing paradigm of matching 'expected viewer responses' with 'actual viewer responses' based on anxiety durability and intensity of viewers fear responses to fear stimuli in the film clips. The testing of the EDA model of suspense was also dependent on a textual analysis of the film clips that elicited the mediation peak samples in the tests.

The use of descriptive statistical measurements was also important in the validation of the EDA model of suspense. This included transforming skin conductance response (SCR) amplitude scores to z-scores, scatter plots and identifying a correlation relationship between two variables e.g. 'expected viewer responses' with 'actual viewer responses'. The application of textual analysis (qualitative) combined with descriptive statistics (quantitative data sets) also demonstrates that it is possible to successfully combine qualitative and quantitative methods to validate a psychophysiological (EDA) model of suspense.

The findings from the validation of the EDA model of suspense confirms that Susan's Smith's suspense narrative structures (vicarious, direct and shared) can elicit different types of anxiety response in terms of durability and intensity level. Moreover, in some instances these narrative structures elicited a sustained strong form of suspense, indicated by a maximum anxiety durability of 14.0 seconds in duration with an extremely high level of intensity (level 1). This evidence contradicts Susan Smith's assumption that these small suspense sequences extracted from a feature film cannot elicit a strong form of suspense in isolation compared to watching the same sequence in the feature film. The viewer psychophysiological pattern of suspense advances Brewer & Lichtenstein's suspense narrative event structure (chapter 1) where suspense is not a gradual build up between an initiating and outcome event and that the continuous visual and aural stimuli after the initiating event can strongly influence viewer anxiety responses such as the highest level of intensity occurring well before the perceived outcome. Psychophysiological suspense provides a great insight in how

the viewers experienced suspense through their own individual psychophysiological signature.

Turning to the analysis of individual viewer mediation responses to the same fear stimulus in a film clip during the testing of the EDA model of suspense, it was found that 60% of viewer mediation peak responses occurring within 1.0 second of the same stimulus produced different mediation peak responses in terms of durability or/and intensity level. This means that it was more likely that viewers responded differently to the same fear stimulus which means that clusters of the same mediation peak response (e.g. 'Extended Fear' level 1) were less likely to occur. In particular, when identifying clusters of the strongest mediation peak response, 'Extended Fear' level 1 were less likely than 'Momentary Fear' level 4. This because 'Extended Fear' level 1 responses accounted for 14% compared to 29.9% for 'Momentary Fear' level 4 response. With 'Extended Fear' level 1 responses representing the strongest form of suspense and unlikely to be found in clusters, then when small clusters of 2-3 'Extended Fear' level responses can be matched to a fear stimulus demonstrates that the fear stimulus is significant in eliciting a strong form of suspense.

The discussion will now turn to chapter 4 where the EDA model of suspense will be used to analyse four case studies, one film clip representing each narrative structure vicarious, direct, shared and composite suspense. The analysis will include the formal features of the clips, mediation peaks and viewer feedback responses. The focus concerning mediation peaks as discussed in this chapter will be used to determine fear stimuli in a film clip that elicits a prolonged form of anxiety at the highest level of intensity. This means that small clusters of 'Extended Fear' level 1 responses will be used to identity the strongest fear stimulus and where applicable 'Extended Fear' level 2 responses will also be included. In the case of identifying a fear stimulus that elicits a condensed anxiety response at a high level of intensity 'Momentary Fear' level 1-2 responses will be used in the analysis. Level 3-4 mediation peak responses will be mentioned where applicable to a weaker form of suspense or when a viewer reacts with more than one mediation peak response during a film clip, referred to as a multi-mediation peak responder.

Chapter 4
Psychophysiological Suspense: Narrative Structures

Introduction

Although film scholars and media psychologists have developed theories of suspense through textual analysis based on viewers' hope, fear, uncertainty (Carroll, 1996; Yanal, 1996); interest (Tan, 1998); mood cues (Smith, G. 2007:45) and genre (Derry, 2001; Rubin, 1999), the viewing experience has had little attention, in particular viewers' psychophysiological experience of suspense. In this chapter the EDA model of suspense (discussed in chapter 3) will be used to analyse viewer psychophysiological responses by defining suspense through two variables that measure viewer anxiety to fear stimuli in a film clip by durability and intensity. The model is used to analyse viewers' psychophysiological responses in relation to Susan Smith's suspense narrative model that comprises three forms of suspense: vicarious, direct and shared. The analysis will also include a composite form of suspense which is created through a combination of vicarious, direct and shared suspense (Smith, S. 2000: 18-25). The analysis and discussion of viewer psychophysiological responses determines the relationship between viewer physiological responses (EDA) and viewer psychological reactions to fear stimuli presented in horror film clips (e.g. being scared). A broadly qualitative approach will be taken to analyse quantitative (viewer mediation peak responses) and qualitative (viewer feedback) data sets to ascertain the extent to which Susan Smith's suspense narrative model operates within the horror film genre. Four film clips will be selected for the analysis, each being a case study representing vicarious, direct, shared and composite suspense. The film cases case studies will dig deeper into the specific narrative structures and demonstrate that the EDA model of suspense is a good fit to measure Susan Smith's suspense narrative model, making them a useful synthesis.

For the purposes of understanding the construction of suspense, David Bordwell's narrative model will be applied, where the syuzhet (plot development) cues, conceals, or delays narrative information to the viewer to create the fabula (story). This invites the viewer to make assumptions, inferences and anticipations about narrative events. The relationship between syuzhet and fabula is an essential narrative mechanism for eliciting suspense (Bordwell, 1985: 55) and positioning the viewer in relation to fictional characters and the story world. This chapter will bring together Susan Smith

and Bordwell's models to tease out the subtle differences between different constructions of suspense and interrogate which structures elicited the strongest viewer responses. The discussion will now turn to Susan Smith's suspense narrative model and how the viewer is positioned in relation to fictional characters and the story world through vicarious, shared, direct and composite suspense.

Suspense Narrative Model

Susan Smith's suspense narrative model defines how viewers develop different levels of emotional involvement with fictional characters, in particular the protagonist, through three suspense narrative structures that Smith calls vicarious, direct and shared. Susan Smith's suspense narrative model was developed through her textual analysis of Alfred Hitchcock's films and based on his definition of suspense, discussed in chapter 2, as viewer identification with fictional characters. According to Susan Smith, Alfred Hitchcock's prototype suspense narrative structure (Truffaut, 1985: 72-73), which she calls vicarious suspense, is when the viewer is privileged with information about a fictional character's (usually the protagonist) situation that they themselves are unaware of (Smith, S. 2000: 18-20).

To illustrate vicarious suspense Susan Smith provides an example from *Sabotage* (Hitchcock, 1936), where a boy (Desmond Tester), takes a package on a bus unaware it contains a bomb. The viewer, however, is fully aware of the danger and that the bomb will explode and kill the boy. Suspense is created vicariously because viewer anxieties are driven by the bomb being a threat to the boy's life and knowledge that the boy is unaware his life is any danger. Additional narrative events further intensify suspense. First, when the viewer hears the bomb's clock ticking in the parcel and, secondly, when they watch the minute hand on the clock moving closer to the time of the explosion. Smith argues that vicarious suspense does not offer the viewer full emotional involvement with the protagonist because the viewer has privileged information about the dangers threatening the protagonist's life, which they are denied: 'In vicarious cases, therefore, the intellectual and emotional strands inherent in all suspense become separated, resulting in a vicarious viewing position consisting of both distance from, and involvement with, the character(s) concerned' (Smith, S. 2000 : 19).

In contrast, Smith explains that shared suspense is where the viewer gains a deeper empathetic connection with a fictional character. She provides an example of this from the film *Rear Window* (Hitchcock, 1954), where the viewer shares suspense with Jeffries (James Stewart) looking through his binoculars, watching Thorwald, the antagonist, as he returns to his own apartment, placing Jeffries' lover Lisa (Grace Kelly) in grave danger, as she is searching Thorwald's apartment for clues about the mysterious disappearance of his wife. The viewer shares suspense with Jeffries because both viewer and Jeffries are concerned about Lisa's safety but both are powerless to rescue her from the threat posed by Thorwald. Susan Smith argues that when the viewer shares the protagonist's mental and emotional states, the viewer develops a more fully developed emotional bond with the protagonist than is the case with vicarious suspense; therefore, according to Susan Smith, shared suspense offers potentially a powerful form of suspense (Smith, S. 2000: 20 and 22).

Direct suspense is very different to vicarious and shared suspense. As Susan Smith explains, direct suspense is essentially where the viewer experiences suspense alone rather than through an emotional bond with a protagonist. For Susan Smith, the purest form of direct suspense is when the point-of-view (POV) camera shot is seen in the first person and the viewer experiences suspense directly. This viewing position is also known as the subjective viewpoint (Katz, 1991: 267). Susan Smith provides an example of direct suspense from *Psycho* (Hitchcock, 1960) when Lila (Vera Miles) discovers the body of Norman's (Anthony Perkins) dead mother when '…we are confronted quite directly with the dead woman's grinning skull via a final shot that presents it in close up…' (Smith, S. 2000: 25). Another example from Susan Smith refers to the viewer seeing a message on screen that relates to the boy carrying the bomb on a bus in *Sabotage* (Hitchcock, 1936). She identifies the moment:

> When the professor's message DON'T FORGET THE BIRDS WILL SING AT 1.45 is used by Hitchcock to confront and warn the viewer directly. Such direct forms of address as this consequently evoke the sense that, ultimately, it is us, not the character, who is the real target of attack (Smith, S. 2000: 23)

Therefore, according to Susan Smith, direct suspense occurs when the viewer watches in the first person POV, which results in the antagonist launching a direct attack on the viewer. This viewing POV is used to increase viewer anxieties as shown in the example above of the professor's message informing viewers when the bomb will explode and kill the boy.

Susan Smith also argues that direct suspense can be synchronised with vicarious and shared suspense creating a hybrid form of suspense or they can operate side by side forming what she describes as a composite form of suspense: 'The experience of direct suspense thus coexists *alongside* the shared and vicarious forms…'[my emphasis] (Smith, S. 2000: 24). She argues that the combination of vicarious, shared and direct as a composite form of suspense is a '…highly stressful form of suspense that operates well beyond the confines of any one character' (Smith, S. 2000: 24). However, Susan Smith's example of direct suspense from the film *Psycho* (Hitchcock, 1960) when Marion (Janet Leigh) is about to be killed by Norman (Anthony Perkins) in the shower scene suggests a hybrid form of suspense. She argues that:

> …just before the murder of Marion in the shower, our fears for her safety, on seeing a shadowy figure loom up behind the curtain, give way, as she gradually recedes from the frame, to momentary sensation that we are about to be attacked directly (Smith, S. 2000: 24)

Susan Smith describes a hybrid form of suspense with vicarious synchronised with direct suspense at the same time. Vicarious suspense is created because Marion is unaware of Norman's presence or that he poses a serious threat to her life. However, direct suspense operates at the same time when Marion recedes from the camera frame, providing the viewer with a first person POV of Norman, who appears as if he is about to attack the viewer. This example informs us of the following: firstly, two different suspense narrative structures can form a hybrid narrative structure operating at the same time. Secondly, according to Susan Smith's definition, composite suspense is different to a hybrid form of suspense because composite suspense comprises vicarious, direct and shared suspense working alongside each other. Thirdly, it demonstrates how difficult it is to completely separate Susan Smith's suspense narrative structures within a short film clip.

Nevertheless, Susan Smith's narrative model of suspense is a valuable narrative framework in horror films to measure the construction of suspense through three specific story structures. Vicarious, shared and direct suspense all offer different ways the viewer is positioned in relation to fictional characters. For example, vicarious suspense in a horror film can be used to increase viewer anxieties when the antagonist is behind the protagonist who is unaware of any danger. As mentioned previously, for direct suspense the viewer can experience a direct attack, which is a commonly used narrative structure used in horror films to scare the viewer (Hutchings, 2004; Smith, S. 2000). Shared suspense can intensify suspense by inviting the viewer to empathise with the protagonist in a horror film whose life is being threatened by a known or unknown antagonist. However, the three narrative structures (vicarious, direct and shared) are difficult to separate as mentioned previously in Susan Smith's example in the film *Psycho* (Hitchcock, 1960), where vicarious and direct suspense are synchronised during the shower scene. Moreover, Susan Smith's narrative model of suspense is based on textual analysis and has not been tested through the lens of viewer responses.

The Case Study Analysis Structure

This chapter will provide an in-depth viewer experience of Susan Smith's suspense narrative model through four case studies from the 'Terror & Tension' film experiment. Due to the problems of separating vicarious, direct and shared suspense into short film clips, the dominant narrative structure of each film clip will be identified (along with any minor overlaps from other narrative structures). The analysis will begin with a textual analysis of the formal narrative elements that construct suspense in the film clip. This construction clearly comprises both narrative elements and cinematic techniques, such as cinematography, sound, editing and mise-en-scène. The discussion here will analyse Susan Smith's suspense narrative model by focussing on the construction of suspense through the different narrative elements and plot development. This narrative analysis technique was used by David Bordwell when he analysed the narrative elements and plot development by separating the

syuzhet (narrative and plot development) and style (cinematic techniques) (Bordwell, 1985: 50).

However, the process of separating narrative elements and plot development from cinematic techniques can be challenging, because narrative and style are intertwined and are difficult to separate completely. For example, 96.8% of the film clips are filmed in the dark, which relates to lighting and strongly influences the way the viewer will contextualise the plot and story of the four different narrative structures. However, in this chapter the textual analysis will attempt to limit cinematographic techniques to how the camera positions the viewer in relation to fictional characters through different camera shots, frame and movement. To contextualise the story experience there will also be a limited use of mise-en-scène. The more visual or aural cinematic techniques in the construction of suspense will in turn be explored in more detail in the following chapter. I will then use the EDA model of suspense (discussed in chapter 3) to measure and define suspense through viewer anxiety responses to fear stimuli in the film clips, using two variables: anxiety durability and intensity level. As mentioned in chapter 3, the most suspenseful moments during a film clip can be detected by small clusters of 'Extended Fear' or 'Momentary Fear' level 1-2 responses, because they both indicate when viewers experience an anxiety response at a high level of intensity. However, 'Extended Fear' or 'Momentary Fear' level 3-4 responses are still important because they demonstrate when and viewers experiences a specific anxiety response to fear stimuli in a film clip.

Thus, whenever possible, the analysis will focus on clusters of 'Extended Fear' level 1 responses, because they represent a prolonged anxiety response at an extremely high level of intensity. As discussed in chapter 3, viewer feedback comments do not always provide pertinent narrative information concerning the construction of suspense, yet still the viewers react with either an 'Extended Fear' or 'Momentary Fear' level 1-2 response. Where applicable in these cases, the viewers' mediation peak response will be listed next to the image of the fear stimulus that elicited the mediation peak response, but the viewer's feedback comments will not be discussed when they have no relevance to suspense narrative. The discussion will now turn to the film case

studies, which will begin with direct suspense with the case study being *Grave Encounters 2*, followed by *The Descent* (shared suspense), *Silent House* (composite suspense) and finally *Quarantine* (vicarious suspense).

Direct Suspense

Direct suspense is not reliant on the viewer feeling empathy for the protagonist(s), as in the case of shared and vicarious suspense. Instead, direct suspense invites the viewer to engage with the story world through the first person point-of-view (POV), which enables the viewer to experience narrative events directly rather than with the protagonist. Direct suspense can also be synchronised with shared suspense when the viewer watches through the protagonist's POV. Turning to viewer mediation peak responses, 'Extended Fear' level 1 responses for direct suspense accounted for 12.5% of total viewer mediation peak responses, which is 1.5% below the average across all narrative structures. This low score for 'Extended Fear' level 1 responses occurred because 22% of the case study direct suspense film clips attempt to trigger suspense through a startle stimulus, which in the majority of cases either produced a medium (3) or low (4) level anxiety response or no mediation peak response at all.

This finding validates the use of EDA recording for measuring suspense that forms a longer anxiety response than would occur from a sudden startle response that makes viewers jump (see chapter 3). The low quantity of 'Extended Fear' level 1 responses being recorded also indicates that the startle stimuli in these film clips were unsuccessful in heightening suspense through a prolonged anxiety response at an extremely high level of intensity. *Grave Encounters 2* has been selected as the case study for direct suspense because of the following three reasons: firstly, 'Extended Fear' level 2 responses accounted for 14.6% of total mediation peaks, which is 8.6% above average across all narrative structures, indicating that these viewers experienced a higher level anxiety response that the other direct suspense examples. Secondly, the film clip did not contain a specific startle stimulus that was directed at the viewer and, thirdly, *Grave Encounters 2* was the only direct suspense film clip that positioned the viewer through the protagonist's POV. This provides an opportunity to investigate

whether and how this form of direct suspense is synchronised with shared suspense because the viewer experiences suspense through the eyes of the protagonist.

Case Study 1 - *Grave Encounters 2*

The *Grave Encounters 2* direct suspense clip is 38.0 seconds in duration and produced 41 viewer mediation peak responses from 90% of total viewers. 56% of these mediation peaks were 'Momentary Fear' and 44% were 'Extended Fear'' indicating that 12% more viewers experienced suspense through a condensed form of anxiety than a prolonged anxiety response. 72.2% of the sample were multi-mediation peak responders (viewers who produced more than one mediation peak during a film clip). When considering different viewer mediation peak intensity levels, 'Extended Fear' level 1-2 accounted for 19.5% of total mediation peaks responses, which is 9.9% more than 'Momentary Fear' level 1-2 being 9.6%. This informs us that viewers were more likely to experience a prolonged anxiety response with a high level of intensity than a condensed anxiety response.

When analysing the film clip, all 'Extended Fear' level 2 responses occurred between 2.0-18.7 seconds, and 65.2% of 'Momentary Fear' responses occurred during 18.8-36.0 seconds, including, all 'Momentary Fear' level 1-2 responses. These findings tell us that the most suspenseful sequence in the *Grave Encounters 2* film clip was between 2.0-18.7 seconds, because it elicited a strong form of suspense compared to the sequence during 18.8-36.0 seconds, which elicited a condensed anxiety response. Therefore, the analysis of *Grave Encounters 2* will focus on the 2.0-18.7 second film sequence to identify how direct suspense positions the viewer in relation to the protagonist's POV through a hand held camera, and how the plot conceals and delays narrative information in order to elicit suspense. Finally, the analysis will include viewer mediation peak responses, viewer feedback themes and comments to provide a comprehensive analysis of viewer responses to identify how the clip constructs direct suspense.

The setting for *Grave Encounters 2* is an abandoned mental hospital, in which a group of friends are making a documentary. The sequence at 2.0-18.7 seconds positions the

viewer through the protagonist, Tessa Hamill's (Stephanie Bennett) POV. She is alone somewhere in the abandoned hospital in the dark searching for her friends and using a hand held camera with night-vision switched on so she can see in a dark. The film clip begins with Tessa walking along a dark corridor searching for her friends. A hand held camera zooms in on a hospital bed in the distance, which is on the right side of the corridor. Suddenly on 2.0 seconds (Figure 4.1) the camera zooms out and slightly shakes as Tessa continues to walk along the dark corridor.



Figure 4.1. At 2.0 seconds the camera zooms out from the hospital bed as Tessa walks along the corridor alone.

On 3.0 seconds Tessa says 'Hey Guys'. Then on 5.0 seconds (Figure 4.2) the camera tilts downwards so the viewer sees the floor of the corridor, quickly followed by the camera tilting upwards on 6.0 seconds (Figure 4.3), as Tessa walks past the hospital bed and approaches an old wheelchair on the left side of the corridor. On 7.6 seconds, Tessa speaks again, saying 'Alex'. This is followed by Tessa saying, 'Oh my God' on 9.7 seconds as she walks hesitantly toward towards the old wheelchair. On 13.0 seconds (Figure 4.4), the camera tilts down showing Tessa's feet and legs walking in a forward direction along the corridor floor. On 14.0 seconds (Figure 4.5), the camera tilts upwards again as Tessa approaching an open doorway, which leads to a long dark corridor with closed doors on both sides of the corridor. Then, on 16.0 seconds (Figure

4.6), Tessa walks through the doorway and, speaks, 'Hey guys', with the viewer watching the closed doors on both sides of the corridor; the film sequence finishes on 18.7 seconds.



Figure 4.2. At 5.0 seconds, the camera tilts downwards showing the floor of the corridor.



Figure 4.3. At 6.0 seconds, the camera tilts upwards as Tessa approaches a wheelchair.



Figure 4.4. At 13.0 seconds, the camera tilts downwards showing Tessa's leg and foot.



Figure 4.5. At 14.0 seconds, the camera tilts upwards showing the open doorway and corridor.



Figure 4.6. At 16.0 seconds, Tessa walks through a doorway along the corridor with doors on either side.

When considering viewer comments about the film clip, it is informative to note that after the most suspenseful film sequence (2.0-18.7 seconds), 40% of viewers described they were scared when the doors along the corridor suddenly burst off their hinges during a supernatural attack on Tessa during 22.0-36.0 seconds. However, the physiological data indicate viewers felt a more prolonged form of anxiety with a high level of intensity during 2.0-18.7 seconds, moments before an explicit threat from the antagonist and sudden attack on Tessa during 22.0-36.0 seconds. Moreover, during the sequence when the doors are blown off their hinges and Tessa is attacked, viewer 'Momentary Fear' responses accounted for 65.2% of total mediation peaks during the sequence. This informs us that viewers were more likely to experience a condensed form of anxiety during the attack and that viewer mediation peak patterns can define our response depending on the purpose of the fear stimulus, whether it is to elicit suspense or a direct threat and attack on the protagonist.

Turning to a textual analysis of the film sequence, direct suspense is created via the hand held night vision camera positioning the viewer through Tessa's POV. This camera technique creates an ambiguous viewing experience because the viewer is watching the scene through Tessa's eyes and yet the viewer could perceive the viewing

position as the first person POV with suspense being directed at the viewer. This ambiguous viewing position becomes problematic for the viewer in terms of building an emotional bond with Tessa, because the POV conceals her physical identity from the viewer. According to Susan Smith's model, this would make it more challenging for the viewer to develop empathy or an emotional bond with Tessa. The ambiguity of the viewer's position is mitigated through brief and intermittent dialogue by Tessa, which reveals to the viewer that she is alone, frightened and desperate to find her friends. However, most viewers who took part in the film experiment discussed a more direct, first person perspective of the sequence, focusing on their own responses, rather than filtering them through Tessa's. The importance of the first person POV emerges throughout the following discussion on the film clip.

The use of first person POV attempts to construct suspense in the following ways: firstly, by concealing the identity and location of the antagonist which invites viewers to make assumptions about future narrative events that pertain to the antagonist, such as who, how, when and where they will attack Tessa? Secondly, the camera POV constructs suspense by concealing narrative information from the viewer, through its limited viewing position. For example, viewers cannot see what is happening behind Tessa unless the camera pans behind her or she places the camera in a position where the viewer can see behind her. Thirdly, the camera POV attempts to construct suspense by playing on viewer expectations of a direct attack on them, such as something frightening suddenly appearing on the screen and making them jump from their seat. Fourthly, the camera angle, the 'dutch tilt' or 'dutch angle' disrupts the viewer's perception of the vertical axis of the frame (see previous figure 4.6) creating an anxiety response as cinematographer Blain Brown explains:

> …human perception is much more sensitive to off-level verticals than to off-level horizontals. If the camera is even a little off, walls, doorways, telephone poles, any vertical feature will be immediately seen as out of plumb. There are instances, however, where we want the visual tension of this off-level condition to work for us to create anxiety, paranoia, subjugation, or mystery (Brown, 2012: 66)

Blain Brown's description of the 'dutch tilt' demonstrates how the camera frame can create additional anxiety to the narrative information so that viewers elicit a strong

anxiety response. The discussion will now analyse viewer responses to understand how viewer mediation peak responses and viewer feedback comments determine the construction of suspense in *Grave Encounters 2*.

Throughout the viewers' mediation responses and feedback comments, two overarching themes emerged that contributed to the construction of suspense in *Grave Encounters 2*: the use of the hand held camera with night-vision, and the setting of a dark abandoned mental hospital and the long dark corridor. Both of these themes revealed the way in which participants positioned themselves in relation to the clip's diegesis and Tessa and so the construction of a direct form of suspense. 55% of viewers stated that the hand held camera with night-vision created 'quite a scary build-up' during the film clip. Viewer 16 (male), for instance, was a multi-mediation peak responder reacting with an 'Extended Fear' level 2 on 12.0 seconds (Figure 4.7), a 'Momentary Fear' level 2 on 24.0 seconds and a 'Momentary Fear' level 4 response on 34.7 seconds.



Figure 4.7. At 12.0 seconds viewer 16 reacted with an 'Extended Fear' level 2 response.

This indicates that viewer 16 experienced a more sustained form of anxiety at 12.0 seconds compared to mediation peak responses at 24.0 and 34.7 seconds. He explained that the night vision camera and watching the scene in the first person POV as being key to his experience: 'The night vision and first person view actually makes it really scary.' What is interesting is that viewer 16 thought he was watching the film clip through the first person and not through Tessa's eyes. This informs us that viewer 16 experienced suspense directly rather than sharing suspense with Tessa. Moreover, his comments inform us that Tessa's brief and intermittent dialogue did not have the desired impact to increase an empathetic response towards her.

Viewer 5 (female), reacted with two 'Extended Fear' responses, one level 4 response at 19.3 seconds and one level 3 response at 27.3 seconds, indicating that she experienced a prolonged form of anxiety with a low and medium level of intensity respectively. However, the 'Extended Fear' level 4 response at 19.3 seconds, when Tessa was walking down a darkened corridor, had a longer anxiety duration of 7.2 seconds, indicating that she experienced a durable form of anxiety response to a fear stimulus even though it had a level low intensity. Viewer 5 again explains the ambiguity concerning the use of the hand held camera and first person point of view as being central to her response to the sequence:

> Again it was from sort of like *your point of view*, and I think it's always creepier when they have it done with like a hand-held camera, because it's almost like you're there and you're filming it, and it's really tense. You also see that with the lighting, it was sort of like a weird greeny colour, so it's sort of night vision. So you can tell it's probably pitch black in there (viewer 5; my emphasis).

For viewer 5, direct suspense was formed through the ambiguity of Tessa's POV, which can be perceived as being similar to watching the clip in the first person POV. Although Tessa can be heard by brief intermittent dialogue, the use of the hand held camera in this way conceals Tessa's identity and encourages the viewer to perceive a first person POV. Viewer 17 (female), also experienced direct suspense through the first person POV and reacted with an 'Extended Fear' level 3 response at 10.2 seconds followed by an 'Extended Fear' level 2 at 18.7 seconds (Figure 4.8). This indicates that viewer 17 would have experienced a prolonged form of anxiety that builds to a

higher intensity level at 18.7 seconds. The rise time duration of the 'Extended Fear' level 2 response at 18.7 seconds was 8.1 seconds, the longest rise time duration elicited by viewers during the film clip.



Figure 4.8. At 18.7 seconds viewer 17 reacted with an 'Extended Fear' level 2 response.

This informs us that at 18.7 seconds viewer 17 experienced a strong form of suspense, which was also reflected in her comments regarding the sequence:

> It's like she's in an insane asylum. Obviously empty. It felt really creepy just watching it, walking down the hallway. You can't really hear anything but there's something there. I wouldn't have been walking down that corridor on my own. It just felt creepy…(viewer 17)

From a narrative perspective, viewer 17 explains how, for her, suspense is driven by Tessa walking alone, along the corridor of the abandoned mental hospital. Viewer 17 also puts herself in Tessa's shoes by stating that she would not walk down that corridor alone because it felt creepy. The connection viewer 17 makes between Tessa's situation and herself being in that same situation demonstrates that watching the scene through the Tessa's eyes invites the viewer to place themselves in the same situation as Tessa.

Viewer 18 (female), who generated an 'Extended Fear' level 2 response on 2.0 seconds, equally described her experience of looking down a deserted corridor of any empty building in the dark in the first person: 'Looking down the corridor…is quite creepy…But you do feel tension because it's an empty, spooky building basically'. Viewer 18 explains that looking down the corridor (Figure 4.9) of an empty building creates tension, but speaks directly for herself, rather than mentioning the protagonist.



Figure 4.9. At 2.0 seconds viewer 18 reacts with an 'Extended Fear' level 2 response.

For viewers 16, 5, 17 and 18, they experience a narrative imbalance between themselves and Tessa, which enables them to experience suspense directly even though the viewer is watching through Tessa's POV. Moreover, with their viewing experience being in the first person they become a non-fictional character in the story world, which according to Melanie Green and Timothy Brock is defined as form of narrative transportation:

> To the extent that individuals are absorbed into a story or transported into a narrative world, they may show effects of the story on their real-world beliefs. We conceptualized transportation into a narrative worlds as a distinct mental process, an integrative melding of attention, imagery, and feelings (Green & Brook, 2000: 701)

Such a first person perspective emerged throughout the viewers' experiences, with only 25% of viewers explicitly mentioning that Tessa being alone and isolated was

most frightening and that they empathised with her situation. This, then, supports the interpretation found in the textual analysis and viewer feedback responses, that Tessa's POV creates an ambiguous viewing position. Tessa's physical identity was not revealed to the viewer throughout the clip, limiting the viewer to building empathy via a combination of dialogue, footsteps and an absence of other onscreen characters. Elspeth Kydd explains the importance of close ups to establishing empathy with fictional characters:

> …a close up of a face can draw us into emotion of a single character as we watch the changes in their expression. Therefore, close ups are used to bring the audience into the story, by enabling them to identify with the characters. The expression on a characters face tells us what they are thinking, so that we can empathise with what they are feeling (Kydd, 2011: 120).

These viewer mediation peak responses and comments reinforce how empathy with a fictional character can be limited when the viewer cannot see and understand their suffering. The use of a direct suspense structure in this clip, therefore, did not overtly contribute to a sense of suspense in viewers. Instead they privileged other elements from the sequence.

Overall, 70% of viewers who thought the clip's setting was 'creepy' and 'scary' also said the hand-held camera with night-vision was frightening, suggesting a overlap between these two themes. For these viewers, the construction of suspense occurred due to a combination of the setting of a dark long corridor of an abandoned hospital combined with the way the night-vision camera positions the viewer in the story world through the POV of the female protagonist. Viewer 11 (male), a multi-mediation peak responder, described how the combination of hand-held camera and the abandoned mental hospital made the clip very scary:

> Again with that whole handheld camera thing, that's quite a scary build-up. And then the fact that it was clearly in a hospital or an asylum, an abandoned one of some sort. It was quite creepy that you couldn't see what was going on and it was all empty, and the abandoned wheelchair (Viewer 11)

For viewer 11, the construction of suspense was created by how the hand held camera produces a direct form of suspense through Tessa's POV, which scared him mostly

during the build-up to the later attack on Tessa. Whilst some viewers referred to Tessa, most viewers spoke in the first person, positioning themselves as separate from Tessa and so fulfilled Susan Smith's model of direct suspense.

However, one participant in particular demonstrated that when direct suspense is created through the protagonist point-of-view, it may result in an empathetic perspective that is more closely defined as shared suspense. Viewer 22 (male), was a multi-mediation peak responder who became absorbed in the story world when experiencing two 'Extended Fear' level 2 responses during the most suspenseful film sequence at 6.2 and 17.8 seconds. At 6.2 seconds the camera pans upwards from the floor, before the camera moves slowly towards the end of dark corridor. This sequence of events elicited a prolonged form of anxiety with a high level of intensity for viewer 22 (Figure 4.10).



Figure 4.10. At 6.2 seconds, viewer 22 reacts with an 'Extended Fear' level 2 response.

At 17.8 seconds the camera positions the viewer in the form of a 'dutch tilt', which, as mentioned previously, creates an imbalance of the story world with the vertical and horizon in the frame being skewed. The image of the dark corridor combined with the 'dutch tilt' camera angle elicited a 'Momentary Fear' level 2 response, indicating that

small abrupt camera movements of a hand held camera produced a condensed form of anxiety response for viewer 22 (Figure 4.11). However, at 26.7 seconds he reacted with an 'Extended Fear' level 1 response when the doors in the corridor exploded off their hinges (Figure 4.12). This mediation peak pattern indicates a chain-reaction of responses that builds on previous narrative events at 6.2 and 17.8 seconds.



Figure 4.11. At 17.5 seconds viewer 22 reacts with a 'Momentary Fear' level 2 response.

The mediation peak pattern of suspense for viewer 22 informs us that the camera movement and angle creates different anxiety responses on 6.2 and 17.5 seconds, reaching a peak at 26.7 seconds. This peak produces a prolonged form of suspense at the highest level of intensity, when the viewer watches a supernatural force making the doors explode in the corridor.



Figure 4.12. At 26.7 seconds viewer 22 reacts with an 'Extended Fear' level 1 response.

In his comments, viewer 22 again described his experience in terms of how the female protagonist's POV concealed narrative information from him, though also discussed how this contributed the sequential building of suspense over the duration of the clip:

> In this film, the night vision played a very big role, because I couldn't see anything else other than the camera. So I didn't know what was going on. Also the complete silence, where I can hear her footsteps felt very real, and felt like I was actually there. It made me feel very scared. And knowing that she was searching for someone, that meant she was alone, that means she was helpless. And suddenly all the doors start breaking open, that just shows that there's something supernatural was there, which instilled fear in me (Viewer 22)

Viewer 22 describes how the hand held camera viewing experience combined with the diegetic sound pattern of footsteps and silence made him feel more absorbed in the story world as the sequences progressed. The difference between these comments and those discussed above, however, is that viewer 22 refers to empathising for the female protagonist's situation by mentioning her being alone and helpless as she searches for her friends, whereas viewer 5, 17 and 18 did not mention empathising with the female protagonist. Instead, their fear was created by imagining they were in the story world, indicating that viewers 5, 17 and 18 experienced suspense directly rather than sharing suspense and empathising with Tessa. This informs us that viewer 22's experience of

the hand held camera (Tessa's POV's) combined with the pattern of diegetic footsteps and silence assisted him in empathising for Tessa, but that this response was highly unusual. This demonstrates that the hand held camera alone with the protagonist POV is unlikely to create a shared form of suspense.

According to Susan Smith, combining direct with shared suspense provides a powerful form of suspense, because the viewer develops a strong emotional bond with the protagonist (shared suspense) and also watches the film in the first person POV, where narrative elements on screen are directed at the viewer (direct suspense) (Smith, S. 2000: 24-25). Based on this premise we can assume that by using a hand held camera with the viewer watching the *Grave Encounters 2* film clip through the eyes of the female protagonist would elicit a sustained form of suspense. Viewer 22, discussed above, does indicate a position of shared suspense, although this was due to him picking up a shared emotion response through the diegetic sounds of Tessa's footsteps. Overall, viewer feedback responses highlighted the ambiguity of the viewing position, as viewers were divided in their opinions as to whether they were watching the film clip from the female protagonist's POV or in the first person POV. As a result of not seeing the female protagonist's facial expressions of fear, some viewers described their viewing experience as first person, imagining that they are playing a non-participatory character in the film clip. This demonstrates that this type of direct suspense in *Grave Encounters 2* enabled these viewers to experience narrative transportation (Green & Brook, 2000: 701), which occurs when the viewer becomes absorbed in the story world. This tells us that direct suspense can elicit such a strong response in viewers that they feel part of the story world and that the use of a hand held camera with night-vison is a valuable cinematography technique that enables viewers to feel they are part of the story world.

However, the hand held camera techniques in *Grave Encounters 2* did not construct shared suspense due to the ambiguity of the viewing position. This indicates that the construction of direct and shared suspense did not produce a sustained form of suspense, as Susan Smith suggested would be the case (Smith, S. 2000: 24). Viewer mediation peak responses indicate that camera movement, angles and the setting of

the dark abandoned hospital produced a more sustained form of suspense during 2.0-18.7 seconds and the attack on the female protagonist (Tessa) during 22.0-36.0 seconds produced a weaker anxiety response with 'Momentary Fear' level 1-4 responses being dominant during this attack. This informs us that viewer physiological responses, and the type of anxiety response' can determine the effectiveness of specific narrative elements and cinematic techniques that operate during the construction of suspense. The discussion will now turn to shared suspense, where suspense is generated through more explicit emotional involvement with the protagonist(s) and when both the viewer and protagonist are aware that the protagonist's life is threatened.

Shared Suspense

The construction of shared suspense relies on the viewer developing a strong empathetic connection with the protagonist. When the protagonist's life is threatened by the antagonist, the viewer is in a state of high tension and suspense about their survival. However, the viewer and protagonist share suspense because they are both aware of the dangers facing the protagonist. Across shared suspense film clips, 14.1% of viewer mediation peak responses were 'Extended Fear' level 1, which is 0.1% above the average of 14% across all narrative structures. This indicates that shared suspense did generate, for some viewers, a sustained form of suspense, even though this would have been intermittent and brief rather than sustained throughout the film clip. *The Descent* has been selected for the shared suspense case study because 20% of total viewer mediation peaks for the clip were 'Extended Fear' level 1, which is the highest across all shared suspense film clips and 6% above average (14%) 'Extended Fear' level 1 response across all narrative structures. Consequently, *The Descent* case study presents as an effective example in producing intermittent moments of a sustained form of suspense.

Case Study 2 - *The Descent*

The Descent shared suspense clip is 38.0 seconds in duration and produced 40 viewer mediation peak responses across all twenty viewers, with a distribution of 57.5% 'Momentary Fear' and 42.5% 'Extended Fear'. This indicates that suspense was

elicited mainly through a condensed form of anxiety rather than a prolonged anxiety response. 20% of total viewer mediation peak responses were 'Extended Fear' level 1, of which 57% occurred during 17.0-23.0 seconds of the film clip, indicating this short film sequence produced a prolonged form of anxiety at the highest level of anxiety during the film clip. The increase in viewers' anxieties during this sequence is further supported by 40% of 'Momentary Fear' level 1 responses. Although this film sequence (17.0-23.0 seconds) will be the focus for the analysis of *The Descent* shared suspense, the discussion will begin with a narrative description starting at 13.0 seconds, just before a surprise narrative event on 14.0 seconds which attempts to trigger suspense. At 13.0 seconds (Figure 4.13), the camera positions the viewer as watching Rebecca (Saskia Mulder) in a cave walking cautiously forward with her back towards the viewer, as if she is aware that something dangerous is nearby. Then, suddenly at 14.0 seconds (Figure 4.14), the antagonist (a zombie) appears from the ceiling of the cave and launches an attack on her. She responds quickly and escapes by running away.



Figure 4.13. At 13.0 seconds Rebecca walks through the caves unaware of a zombie preparing to attack her.

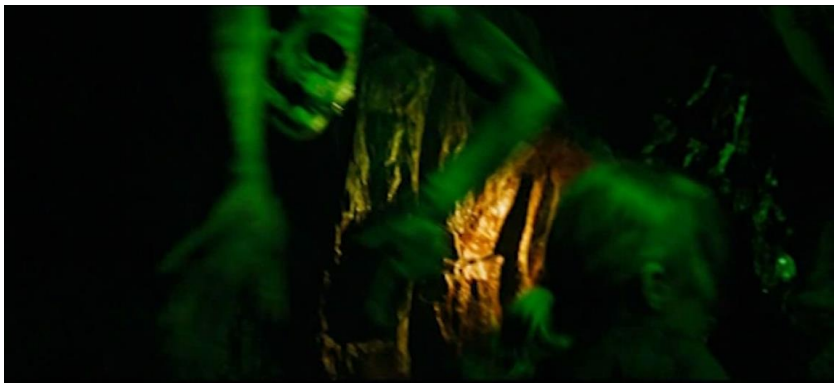


Figure 4.14. At 14.0 seconds the zombie launches a surprise attack on Rebecca.

The camera shot changes at 15.7 seconds (Figure 4.15) to a medium close up of the Rebecca's body, which transforms into a long shot as she runs backwards, looking into the camera in the direction of the viewer. A medium shot occurs at 18.0 seconds (Figures 4.16) showing Rebecca's female colleague Sam (MyAnna Buring) running away. This shot is rapidly followed by further long shot at 19.2 seconds (Figure 4.17), which positions the viewer behind the zombie, who suddenly jumps in front of the camera facing Rebecca, who prepares to fight the zombie using a rock-climbing axe. When the camera shot changes again on 20.0 seconds (Figure 4.18), the viewer watches Sam running through the cave towards the camera with a brief close up of her face at 21.5 seconds (Figure 4.19). The final camera shot changes at 23.0 seconds (Figure 4.20), with the viewer positioned behind the zombie, with the creature ready to launch an attack on Rebecca.



Figure 4.15. At 15.7 seconds shows a camera long shot of Rebecca running backwards away from the zombie.



Figure 4.16. At 18.0 seconds Sam starts to run through the cave to escape the zombie.



Figure 4.17. At 19.2 seconds the zombie suddenly appears in front of the viewer and facing Rebecca, ready to launch an attack on her.

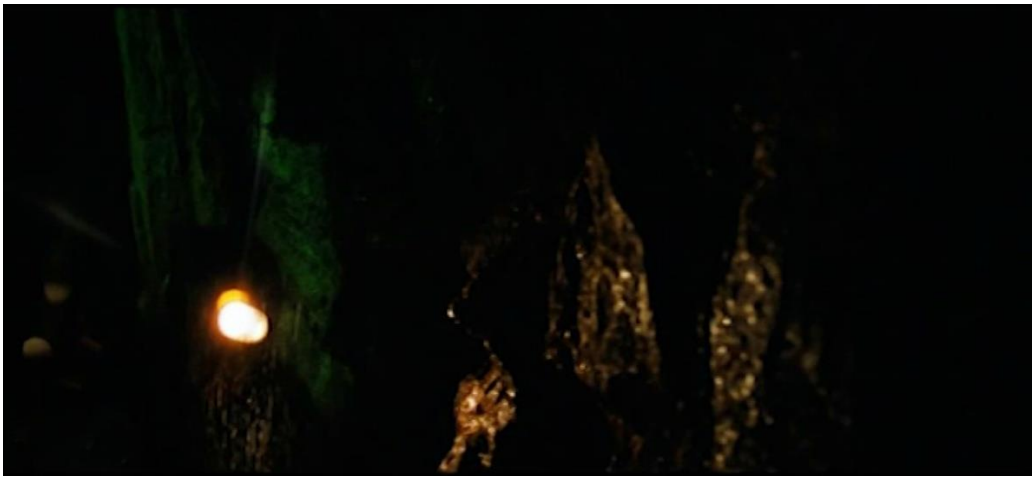


Figure 4.18. At 20.0 seconds Sam runs through the caves.

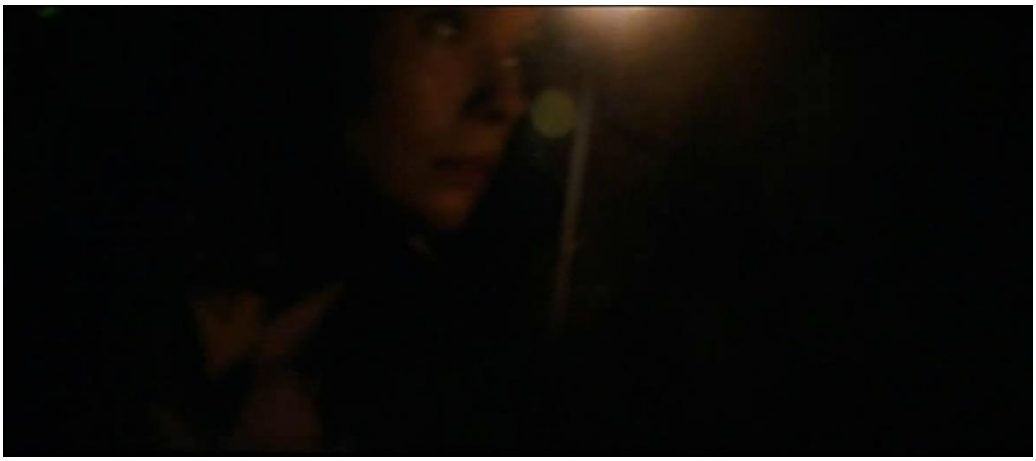


Figure 4.19. At 21.5 seconds a brief close up of Sam's face as she runs through the caves.



Figure 4.20. At 23.0 seconds the fight sequence between Rebecca and the zombie begins.

The discussion will now turn to a textual analysis of how the film sequence constructs suspense between 14.0-23.0 seconds, starting at 14.0 seconds when the viewer is surprised (startle response) by the zombie's sudden appearance from the ceiling of a cave and the attempted attack on Rebecca. This surprise narrative event constructs suspense through the sudden appearance of the zombie, revealing to the viewer the threat and identity of an antagonist, prompting viewers' concern for Rebecca's safety. Suspense heightens after the failed attack, as Rebecca escapes by running away into the dark caves in the distance. This, in turn, invites the viewers to ask specific questions about future narrative events concerning Rebecca, such as: whether she will escape the zombie and survive?

The surprise introduction of Rebecca's colleague, Sam, on 18.0 seconds attempts to increase viewers' anxieties further, because viewers now have two protagonists to be concerned about and who appear to be vulnerable to attack from the zombie. This narrative event constructs suspense by inviting viewers to empathise with Rebecca and/or Sam with viewers' anxieties being driven by anticipating the chances of their survival. Viewer anxieties are further increased when the camera shot changes at 19.2 seconds, to a close up revealing the back of the zombie, with its second surprise appearance, leaping in front of the camera and preparing to attack Rebecca who is shown in long shot in the frame. At this point, Rebecca becomes trapped by the zombie

and a fight between her and zombie is inevitable. Further rapid jump cuts (editing) initially add tension at 20.0 seconds, with the viewer watching Sam running through the caves and past the camera, providing a brief close up of her face on 21.9 seconds. This is followed by another jump cut to increase viewer anxieties when the viewer is again positioned behind the zombie, who is ready to launch his attack on the female protagonist on 23.0 seconds.

The construction of shared suspense is created by increasing the pace of the narrative during the film sequence 14.0-23.0 seconds in three ways. First, when the plot reveals the threat of the antagonist (zombie), through a surprise attack on Rebecca. Secondly, Rebecca and Sam attempting to escape the zombie by running through the dark caves to triggers an empathetic response from the viewers. Thirdly, the pace of the narrative increases further through an action sequence created through fast intercutting of camera shots (one jump cut per 1.5 seconds) between 15.0-23.0 seconds, which initially intensifies suspense, based on the cluster of 'Extended Fear' level 1 and 'Momentary Fear' level 1 responses generated between 17.0-23.0 seconds. Fourthly, the brief close up of Sam's face at 21.9 seconds and finally when the zombie traps Rebecca and is preparing to attack her. Interestingly, the combination of the zombie suddenly jumping in front of the viewer on 19.5 seconds and the brief close up of Sam's face at 21.9 seconds, followed by the zombie preparing to attack the female protagonist on 23.0 seconds, elicited 50% of viewer 'Extended Fear' level 1 and 2 responses and 40% of viewer 'Momentary Fear' level 1 responses. This demonstrates that this short film sequence (19.5-23.0 seconds) for some viewers either generated a prolonged or condensed form of anxiety at the high levels of intensity. The discussion will now turn to analysing viewer feedback responses to find out how suspense was constructed from a viewer's perspective, providing some examples of viewer comments and 'Extended Fear' level 1-2 responses and 'Momentary Fear' responses where applicable, during the most suspenseful film sequence between 19.5-23.0 seconds.

The discussion will first analyse viewer comments that refer to the narrative structure of shared suspense. According to Susan Smith, shared suspense should elicit a shared emotional response between viewers and either Rebecca and/or Sam, because the zombie is seriously threatening their survival and the viewer is aware of their predicament. Although only 10% of viewers explicitly stated that they were concerned for Rebecca's safety, we can draw from viewer mediation peak responses that the most suspenseful sequence was between 19.5-23.0 seconds, when viewers were more likely to have empathised for Rebecca and/or Sam. This is because viewers' anxieties increased during this short sequence indicated by the cluster of 50% of 'Extended Fear' level 1-2 responses and 40% of total 'Momentary Fear' level 1 responses, producing either a prolonged or condensed anxiety response at a high level of intensity. This indicates that viewers' empathetic responses for Rebecca and/or Sam occurred during the build-up to the fight scene (28.0-38.0 seconds) between Rebecca and the zombie. Moreover, suspense declined during the fight scene, indicated by no viewer mediation peaks responses being recorded during 30.0-38.0 seconds.

The Descent's use of a shared suspense narrative structure failed to sustain a strong empathetic viewer connection with Rebecca and/or Sam during the whole film clip. As previously discussed in the *Grave Encounters 2* clip, when the viewer does not have enough information about the protagonist's emotional state, the viewer is less likely to empathise with them. According to Richard Barsam, the close up reveals the character's emotions and state of mind: 'When focused on a character's face, the close-up provides an exclusive view of a character's emotions or state of mind' (Barsam, 2007: 163). This informs us that the viewer not seeing many close ups of Rebecca's or Sam's face limited the clip's ability to build and sustain empathy.

When considering the most popular viewer comments, 70% of viewers described the timing of the zombies attempted attack on Rebecca as being a surprise and 'scary' moment that triggered tension and suspense, which indicates this surprise narrative event initiate shared suspense. For example, viewer 1 (female) was a multi-mediation peak responder, who reacted with a 'Momentary Fear' level 2 response on 2.4 seconds (Figure 4.21) and 'Extended Fear' level 1 response on 17.0 seconds (Figure 4.22).

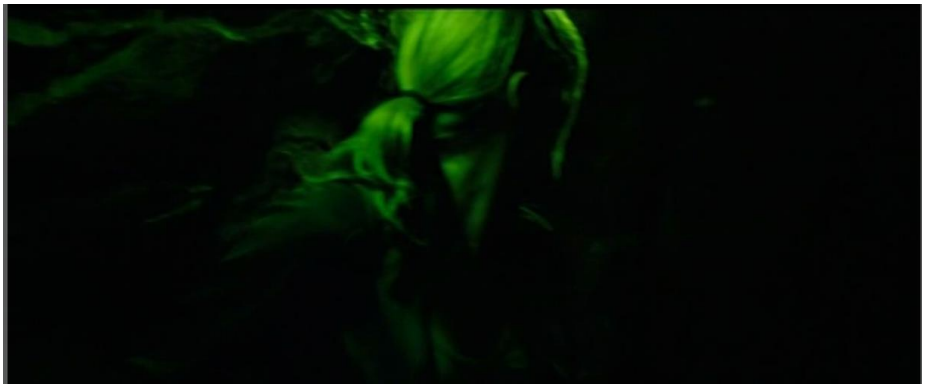


Figure 4.21. At 2.4 seconds viewer 1 reacts with a 'Momentary Fear' level 2 response.

This indicates that for viewer 1, her anxiety response builds to a prolonged form of anxiety at the highest level of intensity when Rebecca attempts to escape from the zombie. Viewer 1 describes how she mentally processed her fear response to the zombie's attempted attack on Rebecca, with her comments describing how the plot's development created the fabula with her asking questions about the plot: 'OK. It makes you jump and then you think: What is that thing? Where has it come from? And why isn't she running faster?...' (Viewer 1; my emphasis). The fabula is often an unknown narrative element that invites the viewer to ask questions or make assumptions about the plot. In the case of viewer 1, her first two questions are about the fabula in that she does not know what the thing is (the zombie) and its location. Viewer 1 also implies that she empathised for Rebecca because she was concerned that she was not running fast enough to escape the zombie, indicating the sudden attack from the zombie initiated a shared emotional response between viewer 1 and Rebecca.



Figure 4.22. At 17.0 seconds, viewer 1 reacts with an 'Extended Fear' level 1 response.

Further evidence to demonstrate that other viewers experienced shared suspense during the build-up to the fight scene is illustrated by viewers 18 (female) and 14 (female) mediation peak responses and feedback comments. Viewer 18 (female), was a multi-mediation peak responder who reacted an 'Extended Fear' level 2 response on 19.5 seconds (Figure 4.23) during the most suspenseful film sequence of the film clip, explains how shared suspense was constructed through her concerns for Rebecca's safety because of the serious threat posed by the zombie:

> …It made me feel tense and worried for her, because they seemed to be everywhere and I how was she going to get out? The slimy look of them was also off-putting, and the noises they were making. They went together, the slime and the noise of them, they blended together to make it more creepy. But I was mostly worried about what was happening to her...(viewer 18)

What is interesting about Viewer 18's feedback comments was that she explicitly states she was very concerned for Rebecca's safety, which demonstrates that viewer 18 empathised for Rebecca. Her empathy response was enhanced by the combination of the creepy zombie's slimy appearance (mise-en-scène) and its vocal sounds.



Figure 4.23. At 19.5 seconds, viewer 18 reacts with an 'Extended Fear' level 2 response.

Viewer 14 (female), who responded with an 'Extended Fear' level 1 response on 22.5 seconds (Figure 4.24) when the zombie makes his second surprise appearance, preparing to launch an attack on Rebecca, explained that the threat of the zombie contributed to her empathising with Rebecca:

> The green horrible man... that was quite an aggressive scene. The use of the lighting, again, made me feel quite scared. I could feel my breathing quickening and my heart-rate increasing. Not knowing what that creature was going to do to them wasn't very nice. It made me feel a bit yucky (viewer 14; my emphasis).



Figure 4.24. At 22.5 seconds viewer 14 reacts with an 'Extended Fear' level 1 response.

The comments from viewers 1, 14, 18 demonstrate that they shared suspense with Rebecca and empathised for her because of the zombie's threatening presence and that he is about to attack Rebecca. However, certain viewers did not empathise with either Rebecca and/or Sam throughout the whole scene and this is demonstrated by the decline in mediation peak responses during the fight scene from 28.0-38.0 seconds, with no mediation peaks recorded during the remaining 8.0 seconds of the film clip. Viewer 25 (male), who reacted with a 'Momentary Fear' level 3 response at 22.4 seconds, explained the reason why shared suspense was not maintained during the fight scene: 'The fight scene wasn't that scary, because you could already see the monster, and she seemed to be handling the situation well'(viewer 25; my emphasis). Viewer 25's comments indicate that he did not empathise for Rebecca because he thought she could overcome the threat of the zombie. This indicates there was an emotional imbalance response between viewer 25 and Rebecca, who would have been feeling very anxious about fighting for her survival.

However, to sustain a strong form of shared suspense the viewer needs to gain continuous access to the protagonist's fears and anxieties and the antagonist needs to appear a consistent serious threat to the protagonist and viewer. This combination of narrative elements encourages and invites the viewer to empathise for the protagonist's suffering. Although the zombie's surprise attack on Rebecca triggered shared suspense, which was maintained during Rebecca's and Sam's attempt to escape from the zombie, for some viewers the familiarity of watching the zombie made it less frightening. For example, viewer 7 (Female), who was a multi-responder reacted with a 'Momentary Fear' level 3 on 6.8 seconds and an 'Extended Fear' level 1 response on 19.4 seconds, said: 'The initial shock is scary. But then as soon as you, as soon as you can kind of see what the creature is more, I felt that the, the suspense was reduced…' We can tell from viewer 7's physiological pattern that she experienced a peak anxiety response during the most suspenseful sequence (19.5-23.0 seconds) when Rebecca and Sam attempt to escape the zombie. However, the decline in suspense for viewer 7, is explained by her seeing too much of the zombie, which occurred during the fight scene during 28.0-38.0 seconds.

Viewer feedback comments shed more light on why suspense diminished during the fight scene, with 25% of viewer comments mentioning they were disorientated when watching *The Descent*. This sense of disorientation was due to the high frequency of camera jump cuts (editing), as seen during the fight sequence (28.0-38.0 seconds); as Richard Barsam explains: 'The jump cut presents an instantaneous advance in the action – a sudden, perhaps illogical, often disorienting ellipsis between two shots caused by the absence of a portion of film that would have provided continuity…' (Barsam, 2007: 262). In *The Descent* the camera shots were also more focussed on the zombie than Rebecca during the fight scene, using long shots, 'dutch tilt' camera angles and close ups of the zombie's face. This was combined with a high frequency of jump cuts (2-3 jump cuts per second during 28.0-38.0 seconds), mainly of the zombie's face. Therefore, following Barsam's interpretation, the confusion felt by these viewers during the fight scene is not surprising, because jump cuts disrupt the narrative flow and diminish viewers' comprehension of the story world. Consequently, jump cuts are a poor editing technique for eliciting suspense and viewer

comments would support this viewpoint. For example, viewer 5 (female), describes how the fight scene between the zombie and Rebecca (28.0-38.0 seconds) was disorienting:

> What stood out most was probably the fact that everything was really green, and sort of gives it an eerie feel, makes you feel a bit nervous. Nothing ever happens that's good in a very green film. And then obviously when the thing jumps out that makes you, startles you a bit. And then, again, it goes very quickly, and you can't really tell what's going on. You can't tell who's winning the fight or, yeah, you just sort of get a bit confused and a bit lost as to what's going on (viewer 5; my emphasis).

The general comments from viewers who felt disoriented concerned how they could not tell what was going on, leaving them feeling 'confused' and that as the camera was very 'shaky' and always moving, they could not get a good look at the zombie or Rebecca. This demonstrates that the continuous use and high frequency of jump cuts had a serious impact on viewer story comprehension and suspense. This is supported by viewer comments who gave incorrect feedback about *The Descent*, when they mentioned that they were watching the film through a hand held camera with night-vision and that there was more than one zombie in the film clip.

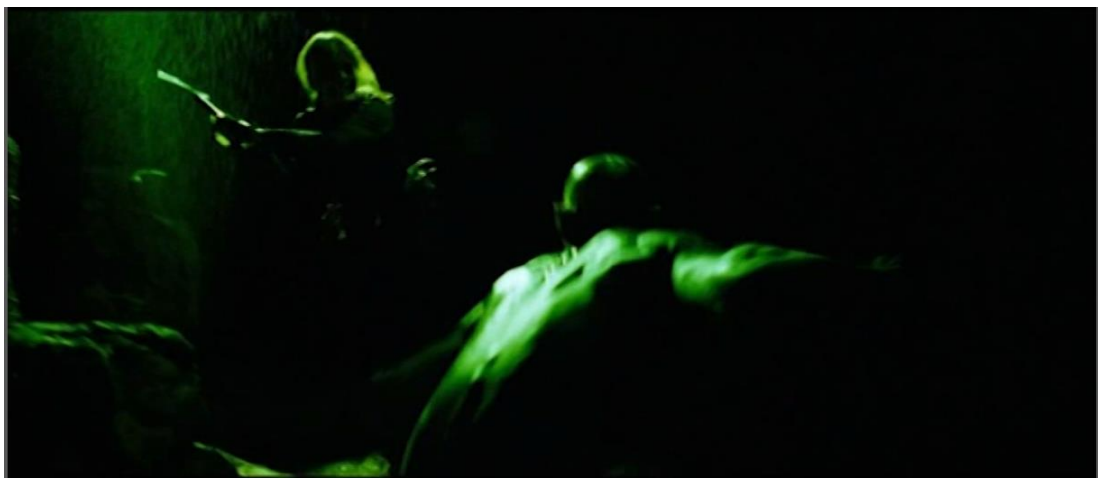


Figure 4.25. At 19.5 seconds viewers 5 and 7 reacted with an 'Extended Fear' level 1 responses.

This overuse of the jump cuts during the fight scene created a barrier to shared suspense and made it difficult for viewers to maintain a strong empathetic connection

with Rebecca and/or Sam. This is because the camera never focuses on either female character's faces during their attempted escape from the zombie, only showing a brief close up of Sam's face at 21.9 seconds and Rebecca' face towards the end of the film clip (36.0 seconds). By doing so the viewer would be able to access either female character's facial expressions and their emotional state, which, as mentioned previously, is essential in order to develop a strong empathetic viewer response to a liked fictional character (Kydd, 2011: 120). The confusion created by editing (jump cuts) and the lack of prolonged close ups and extreme close ups of Rebecca's and Sam's face, limited the clips' potential to generate sustained shared suspense. Viewers had less opportunity to determine Rebecca's sense of suspense and so map it onto their own.

The Descent uses a shared suspense structure in an attempt to construct suspense via viewer empathy with either (or both of) the female characters. Based on this narrative structure, the viewer and both female characters shared suspense through two synchronised narrative features. First, the viewer is encouraged to empathise with both female characters, because they are vulnerable to attack and might be killed by the zombie. Secondly, both female characters' experience suspense because they know their lives are threatened by the zombie and they must escape to survive. According to Susan Smith, this combination of narrative features creates shared suspense, where the viewer develops a strong empathetic response, in this case towards Rebecca and Sam which, Smith argues, generates a very sustained form of suspense (Smith, S. 2000: 22).

Based on mediation peak responses and viewer comments, viewers were more likely to experience shared suspense after the surprise zombie attack on Rebecca and during Rebecca's and Sam's attempted escape from the zombie during the most suspenseful sequence 19.5-23.0 seconds. This is also supported by viewer comments, in particular viewers 1, 14 and 18. However, shared suspense was not maintained during the fight sequence for the following two reasons: firstly, the jump cut editing technique that rapidly advances the pace of the film sequence by deleting a segment of the narrative between two camera shots. This means that viewers have to guess the deleted plot

information and make associations between camera shots. This rapid succession of jump cuts disrupt the narrative flow and violates classical continuity editing which provides a seamless story sequence (Barsam, 2007: 262). Therefore, the filmmaker's decision to increase the frequency of jump cuts from 1 per 1.5 seconds to 3 jump cuts per second during the fight sequence (28.0-38.0 seconds) between Rebecca and zombie made viewers susceptible to disorientation, confusion, diminished suspense, and reduced viewer engagement and narrative comprehension. For example, viewer 6 (male), who reacted with an 'Extended Fear' level 1 at 23.5 seconds, just as the fight scene is about to start, explains how the high frequency of jump cuts that disrupted continuity of the narrative, that '…it's pretty much mess and the camera is very shaky, and it doesn't really give a glimpse of the scene'. Viewer 6 could only be talking about the fight sequence because this was when the frequency of jump cuts was between 2-3 jump cuts per second, which made the image of the film appear like the camera was shaking. Viewer mediation peak responses also provide further evidence that viewers did not experience a significant anxiety response during the fight sequence (28.0-38.0 seconds), especially as there were no mediation peak responses during the remaining 8.0 seconds of the film clip.

Another reason why viewers did not develop a sustained emotional bond with either female character is that they only had a brief close up of Sam's face at 21.5 seconds, when she runs through the caves, and Rebecca's face on 36.0 seconds, just before the zombie tries to bite her neck at the end of the film clip. Literature from both psychology (Caes et al. 2012: 476) and film studies (Kydd, 2011: 120) inform us that people naturally empathise with other people through their facial expressions of fear and pain, unless they are low on the empathy spectrum (Baron-Cohen, 2011: 11). So although *The Descent* did elicit shared suspense during the most suspenseful sequence (19.5-23.0 seconds), this suspense declined because to generate a sustained empathy response viewers need to experience strong fear responses from the threat of the antagonist and they need to see the protagonist's reaction through their facial expressions of fear and pain, in a close up or extreme close up camera shots (Kydd, 2011: 120). The discussion will now turn to the composite form of suspense, which

in the case study combines vicarious, direct and shared suspense which, as Susan Smith argues, produces a very sustained form of suspense (Smith, S. 2000: 22-24).

Composite Suspense

Susan Smith argues that when two or all three suspense narrative structures (vicarious, direct and shared suspense) are combined together, they generate an intense form of suspense (Smith, S. 2000: 24). Although composite suspense elicited the most (38%) viewer mediation peak responses across all narrative structures, composite suspense only generated an average of 11.6% 'Extended Fear' level 1 responses, which is 2.4% below the average (14%) across all narrative structures, which indicated many viewers experienced lower levels of suspense and did not experience a sustained form of anxiety at the highest level of intensity.

The *Silent House* clip produced 4.5% more 'Momentary Fear' level 1 than 'Extended Fear' level 1 responses, which confirms that viewers were more likely to experience a condensed form of anxiety at the highest level of intensity. However, the difference between these two high intensity responses emerges in the number of viewer clusters that occurred during the clip. 'Extended Fear' level 1 responses produced two clusters during 10.8-12.2 seconds and 28.0-35.3 seconds, which were combined with 'Extended Fear' level 2 responses, producing a prolonged form of anxiety at a high level of intensity. A cluster of 'Momentary Fear' level 1-2 responses occurred during 66.0-82.0 seconds, producing a condensed form of anxiety at a high level of intensity. Therefore, *Silent House* has been selected as a case study for composite suspense, because the two clusters of 'Extended Fear' level 1-2 responses produced 52.6% of total 'Extended Fear' level 1-2 response, which is 32.6% higher than the average of 20% across all film clips. Additionally, a 'Momentary Fear' level 1-2 cluster will also form a part of the analysis to highlight where direct and shared suspense was produced through a condensed form of anxiety response with a high level of intensity during a short film sequence.

Case Study 3 - *Silent House*

The *Silent House* composite suspense clip was 89.0 seconds in duration, with 95% of viewers being multi-mediation peak responders with 57.8% of them having at least one mediation peak response during the two of the three clusters (10.8-12.2, 28.0-35.2 and 66.0-82.0). The analysis of *Silent House* will begin with the two 'Extended Fear' level 1-2 clusters, which combined have a duration of 8.4 seconds and produced 52.6% of total 'Extended Fear' level 1-2 responses from the film clip. In addition, these two 'Extended Fear' level 1-2 clusters from *Silent House* are defined by direct (10.8-12.2 seconds) and shared (28.0-35.0 seconds) suspense. The analysis will then focus on a cluster of 'Momentary Fear' level 1-2 responses during 76.0-82.0 seconds, accounting for 60% of total of mediation peak responses during this short sequence. This indicates that these three film sequences 10.8-12.2, 28.0-35.2 and 76.0-82.0 were the most suspenseful during the film clip.

The first two film sequences are linked together, creating a narrative pattern of suspense, which are named as sequence 1A (10.8-12.2 seconds) and sequence 1B (28.0-35 seconds). Sequences 1A and 1B rely on prior story information during 2.0-17.0 seconds, to assist in the elicitation of a prolonged anxiety response at a high level of intensity during 10.8-12.2 seconds and 28.0-25.0 seconds. The analysis will then turn to film sequence 2 (76.0-82.0 seconds), when a 'Momentary Fear' level 1-2 cluster occurred. Although sequence 2 elicits shared suspense, it relies on prior story information through a similar suspense narrative pattern in sequences 1A and 1B. At 45.0-60 seconds, vicarious and direct suspense a synchronised and, at 67.0-68 seconds, direct suspense occurs. The combination of narrative structures at 45.0-60 seconds and 68.0 seconds reveal story information to maximise shared suspense (76.0-82.0 seconds). The discussion will describe how the camera positions the viewer in relation to fictional characters through each suspense narrative structure, and then will analyse these film sequences through textual analysis. This will be followed by consideration of viewer comments through key themes, discussed in relation to viewer mediation peak responses, to identify how vicarious, direct and shared suspense construct suspense separately and combine to form composite suspense.

The *Silent House* clip is filmed in one continuous camera shot, with the camera positioning the viewer in a stationary car located in the front passenger seat and observing the reactions of a female protagonist (Sarah played by Elizabeth Olsen) in the car's driver/passenger seats. We shall now turn to a description of the 2.0-17.0 second film sequence from the film clip, which is linked to the prolonged anxiety response at a high level of intensity during 10.8-12.2 seconds and adds additional suspense from 12.3-17.0 seconds, that attempts to increase a shared suspense response during sequence 1B (28.0-35.2 seconds).

Direct Suspense Sequence 1A: 10.8-12.2 seconds

At 2.0 seconds Sarah looks up towards the rear view mirror and LCD display, which cannot be seen by the viewer (Figure 4.26). At 5.0 seconds (Figure 4.27), the female protagonist recedes out of frame, with the camera panning slowly to the left and tilting upwards creating a direct form of suspense so the viewer can see what the female protagonist was looking at: an LCD display message located close to the rear view mirror reading 'liftgate open'. The camera then pans to the right and tilts downwards showing Sarah with an anxious look on her face as she turns her head so she is looking towards the back of the car in the direction of the liftgate (car boot) on 10.0 seconds (Figure 4.28).



Figure 4.26. At 2.0 seconds, Sarah looks up towards the rear view mirror.



Figure 4.27. At 5.0 seconds, direct suspense is formed when the camera directs the viewer's attention to the LCD message which displays 'liftgate open'.

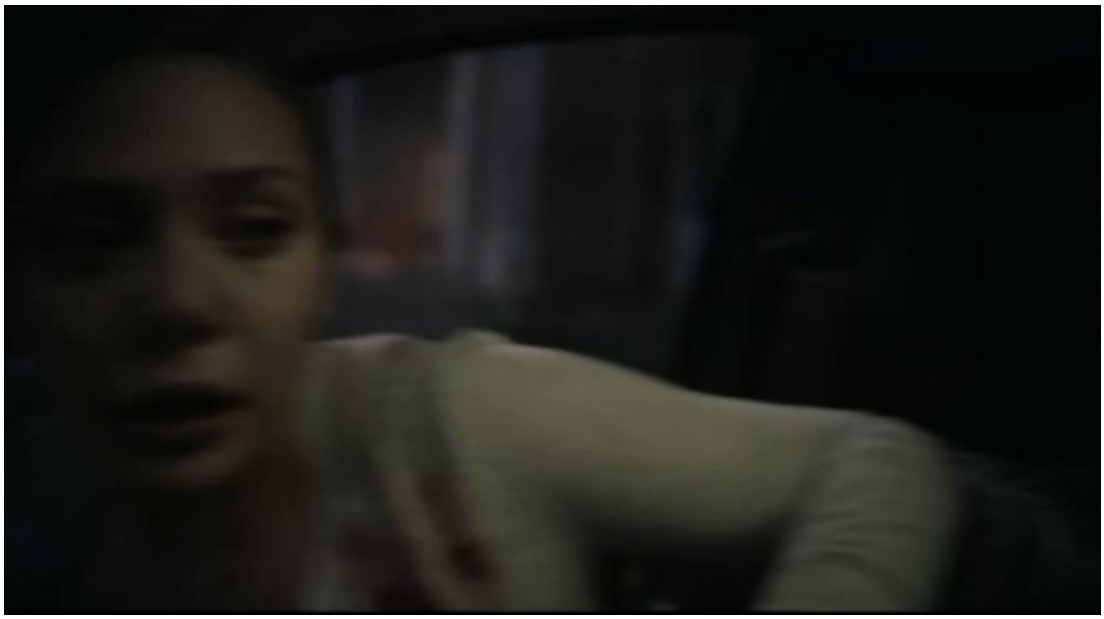


Figure 4.28. At 10.0 seconds, Sarah looks towards the liftgate (boot of car).

Sarah then moves out of the frame when the first cluster of viewer 'Extended Fear' level 1-2 responses occur, indicating these viewers felt a prolonged form of anxiety at

a high level of intensity when the camera pans slowly to the right (10.8 seconds) in the direction of the liftgate, positioning the viewer through the first person point of view (Smith, S. 2000: 24-25) (direct suspense) on 12.2 seconds (Figure 4.29).



Figure 4.29. At 12.2 seconds, direct suspense is formed when the camera directs the viewer's attention to the liftgate which is closed.

The camera then pans to the left on 13.5 seconds with Sarah entering the frame from the left with a worried and anxious look on her face while holding onto the back of the driver's seat of the car, as she looks in the direction of the liftgate on 17.0 seconds (Figure 4.30).

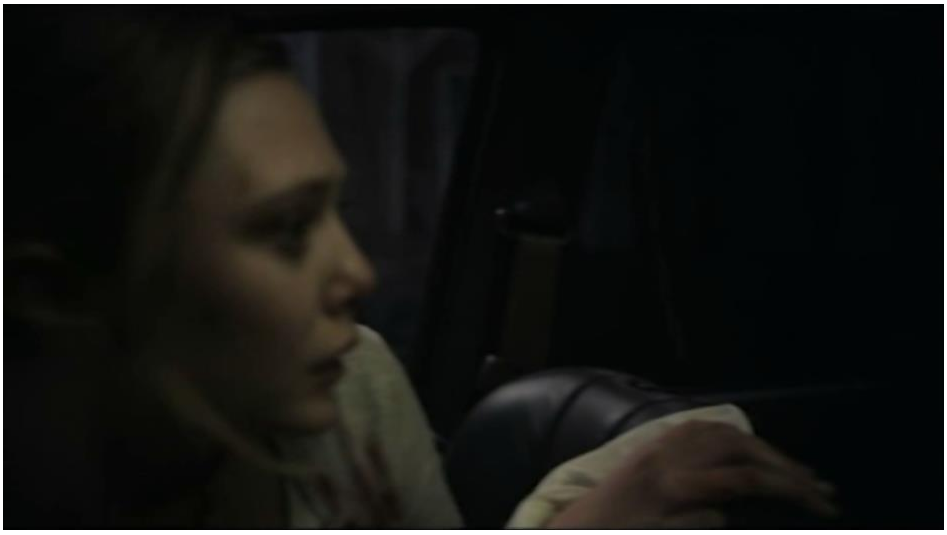


Figure 4.30. At 17.0 seconds Sarah looks in the direction of the liftgate.

Shared Suspense Sequence 1B: 28.0-35.0 seconds

Then between 28.0-35.0 seconds (Figure 4.31-4.33), the second cluster of viewer 'Extended Fear' level 1-2 responses occur, producing a period of prolonged anxiety with a high level of intensity. During this film sequence the viewer watches Sarah turning her face towards the viewer and front of the car, looking increasingly more anxious.



Figure 4.31. At 25.0 seconds Sarah observes what is happening outside of the car as she turns her head away from the liftgate towards the front of the car.

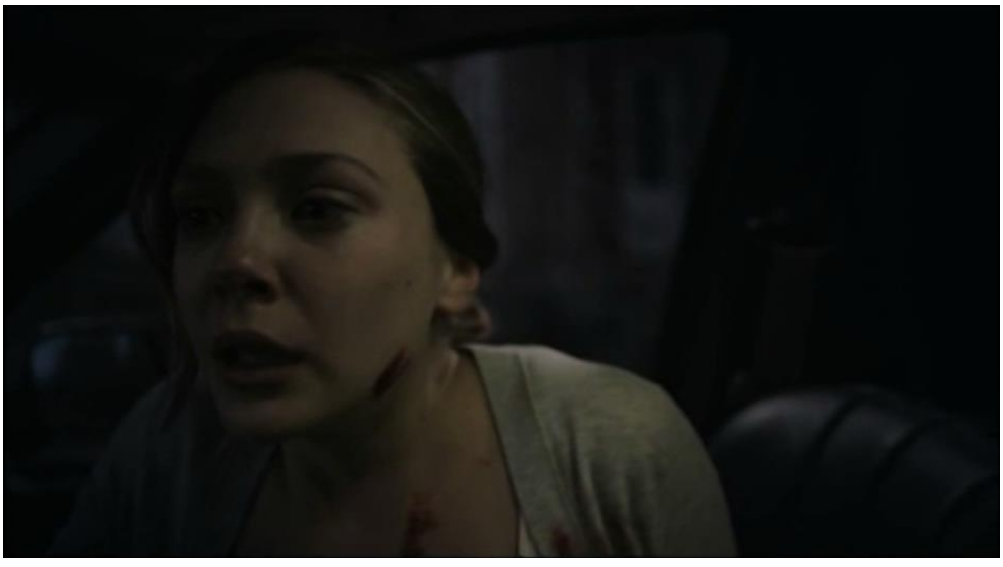


Figure 4.32. At 28.0 seconds Sarah observes what is happening outside of the car as she turns away from the viewer and towards the front of the car.



Figure 4.33. At 35.2 seconds Sarah observes what is happening in front of the car.

Shared Suspense Sequence 2: 76.0-82.0 seconds

As mentioned previously, to understand the story context and narrative pattern of suspense connected to this film sequence we shall start with the description of two prior film sequences at 45.0-60.0 seconds and 66.0-67.0 seconds. At 45.0 seconds, Sarah is looking outside the window of the car at a house (Figure 4.34). The camera then pans upwards slowly, directing the viewers' attention to the rear view mirror so they can see the liftgate opening during 55.0-60.0 seconds (Figure 4.35-4.36), which Sarah is unaware of (vicarious suspense).



Figure 4.34. At 45.0 seconds Sarah is seen looking at a house from the car window.

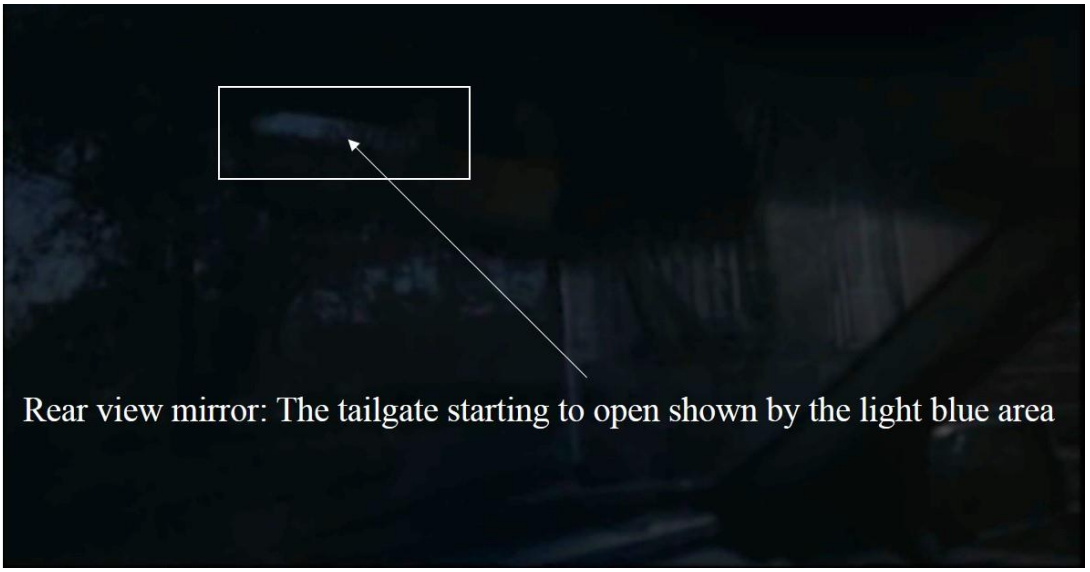


Figure 4.35. At 56.0 seconds the liftgate is 30% open shown by the light blue area in the rear view mirror.

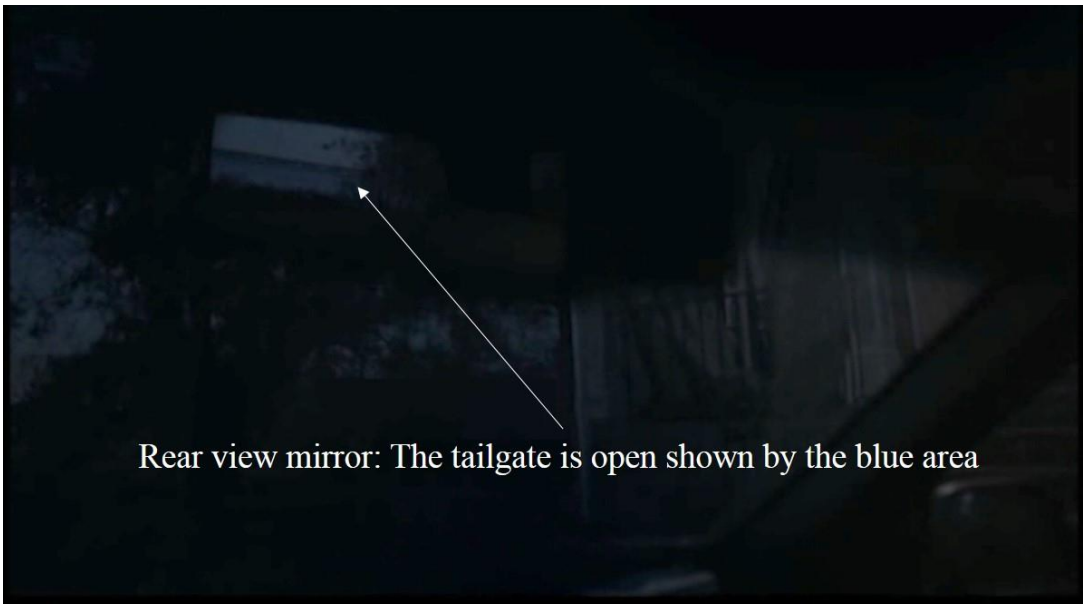


Figure 4.36. At 60.0 seconds vicarious suspense is formed, where the viewer is privileged with the information of the liftgate opening (blue area).

The camera then pans slowly towards Sarah and, at 66.0 seconds, she looks at the rear view mirror, then quickly turns around to look at the liftgate. At 67.0 seconds the camera pans rapidly towards the liftgate, with the viewer watching in the first person

(direct suspense) showing the liftgate open (Figure 4.37); then at 69.0 seconds, the camera pans quickly to the left and shows a close up of Sarah's face in profile.



Figure 4.37. At 67.0 seconds the camera directs the viewers' attention (direct suspense) towards the liftgate, which is open, making Sarah vulnerable to attack.



Figure 4.38. At 74.0 seconds the camera shows a close up of Sarah, who is very frightened that the liftgate is open.

When Sarah is looking in the direction of the liftgate (off screen) at 74.0 seconds, she reveals her facial expressions of fear (Figure 4.38) because now the liftgate is open and she is more vulnerable to an attack from an unknown antagonist. Between 78.0-82.0 seconds, she then turns her head slowly towards the viewer (Figure 4.39) and then in the direction of the front of the car (Figure 40). This sequence creates shared suspense, because the viewer is anxious about Sarah's safety and can see that she is anxious about being attacked through close up and extreme close ups of her face.



Figure 4.39. At 81.0 seconds shows a close up of Sarah's facial expressions of fear.



Figure 4.40. At 82.0 seconds Sarah becomes very frightened when she looks in the direction of the windscreen.

The discussion will now turn to a textual analysis of the prior story information before the three most suspenseful film sequences: 1A 10.8-12.2 seconds, 1B 28.0-35.0 seconds and sequence 1 78.0-82.0 seconds.

Suspense Sequence 1A

The LCD display message 'liftgate open' that is read by Sarah at 2.0 seconds, is initially concealed from the viewers who are, therefore, unaware that this message is frightening to her. At that point the viewer thinks she has just looked up at the rear view mirror to see what might be behind the car, and do not realise that the LCD message is located close to the rear view mirror. This is a reversed form of vicarious suspense, where the protagonist is privileged with information that the viewers themselves are not aware of. The sequence attempts to make viewers question what she is looking at and look for Sarah's reaction. Although on 5.0 seconds, the LCD message is revealed to the viewers when the camera positions them through direct suspense, the plot still denies the viewers what the LCD message means to Sarah. It is only when the she turns her head slowly at 10.0 seconds, in the direction of the liftgate, that the viewers realise Sarah is worried about the liftgate being open. This cues the viewers to anticipate that Sarah fears someone or something can gain access to the car through the liftgate and attack her. This part of the sequence then constructs shared suspense, which invites the viewers to be concerned for Sarah's safety.

Film sequence 1A constructs the different narrative forms of suspense (vicarious, direct and shared) through a cause and effect paradigm. For example: the plot reveals narrative information (LCD message 'liftgate open') to the viewer (cause) through direct suspense, which is followed by shared suspense because viewers watch Sarah's reaction to this message and see her facial expressions of anxiety when she looks in the direction of the liftgate (effect). This cause and effect paradigm aims to increase viewers' anxieties because it invites them to make assumptions about why Sarah is frightened about the liftgate being open and her vulnerability of being attacked by someone or something that can gain access to the inside of the car. Shared suspense is

the dominant narrative structure, because Sarah is seen wearing a blood-stained top during this sequence, indicating she might be injured. However, short bursts of vicarious and direct suspense attempt to maximise shared suspense during the film sequence. For example, at 10.8 seconds, viewers' anxieties are increased when they experience a direct form of suspense, where the camera directs their attention towards the liftgate (Sarah off-screen). This is supported by a cluster of viewer 'Extended Fear' level 1-2 responses, which occurred during the first film sequence, heightening suspense between 10.8-12.8 seconds. Therefore, during this 2.0 second sequence, the viewer is more likely to anticipate possible scenarios of someone or something suddenly appearing at the liftgate window or/and opening the liftgate to attack Sarah. It also elicits high levels of anxiety because viewers are briefly exposed to Sarah's fears that the liftgate is open and her vulnerability to being attacked by an unknown antagonist.

Suspense Sequence 1B

The heightening of suspense during 28.0-35.0 seconds provides a good example of how shared suspense encourages the viewer to form an emotional bond with Sarah through a comparative level of narrative knowledge. First, the viewer watches a close up of the Sarah's face, who becomes increasingly anxious as she turns her head away from the direction of the liftgate and slowly turns her head towards the camera, revealing facial expressions of fear. When viewers watched this film sequence a cluster of viewers reacted with 'Extended Fear' level 1-2 responses, indicating they felt a prolonged form of anxiety at a high level of intensity. Viewers' empathy for Sarah's situation increases because they would have seen her fear through her facial expressions of being frightened. This is supported by viewer feedback responses, which will be discussed later. As previously mentioned in the direct (*Grave Encounters 2*) and shared suspense (*The Descent*) case studies, fictional characters' facial expressions inform viewers what they are feeling and, in this instance, Sarah appears very frightened about being attacked by an unknown antagonist, which strengthens viewers' empathy (Kydd, 2011: 120). The heightening of suspense during this shared suspense film sequence in *Silent House* is caused by a combination of Sarah turning her head slowly towards the viewer between 17.0-35.0 seconds, exposing her

fears to the viewer through a close up of her face, and expressions of fear shown between 28.0-35.0 seconds as well as the plot concealing the identity of the antagonist because viewers think Sarah is about to be attacked.

Suspense Sequence 2

Although this sequence (76.0-82.0 seconds) constructs suspense by repeating similar narrative elements, camera framing and movement (panning) that were used during 2.0-10.8 seconds, 10.8-12.2 and 28.0-35.0 seconds, suspense sequence 2 was initially triggered by vicarious suspense being synchronised with direct suspense during 45.0-60.0 seconds. This hybrid suspense narrative sequence occurred when the camera pans away from Sarah towards the rear view mirror (vicarious suspense) and the viewers watch the liftgate opening in the rear view mirror (direct suspense). This narrative sequence heightens suspense because viewers are now aware that the liftgate is open and are waiting for Sarah's reaction when she finds out. At 66.0 seconds Sarah looks in the rear view mirror, then quickly turns her head towards the direction of the liftgate. At 67.0 seconds, the viewer experiences direct suspense when the camera pans towards the liftgate, similar to the suspense sequence 1A (10.8-12.2 seconds) except this time the camera pans more rapidly. This reinforces Sarah's and viewers' anxieties, because both Sarah and viewer have discovered her worst fears that the liftgate is open and she is terrified she will be attacked at any moment. The sequence also attempts to align the viewers' emotional state of anxiety with Sarah's through use of the rapid camera movement (panning) and a close ups of her face (side view) on 74.0 seconds who is in an agitated state looking at the open liftgate.

During 76.0-82.0 seconds, Sarah turns her head around slowly to face the viewer, then looks in the direction of the windscreen of the car at 82.0 seconds, which attempts to maximise shared suspense. This portion of suspense sequence 2 (78.0-82.0 seconds) follows a similar narrative pattern to the suspense sequence 1B (28.0-35.0 seconds), where the viewers watch Sarah in close up, revealing her facial expressions of fear. However, in sequence 2 Sarah is in a more agitated state of terror because the liftgate is open and her reaction increases viewers' anxieties because they assume that Sarah will be attacked at any second from an unknown antagonist. The combination of

vicarious, direct and shared narrative structures, sudden camera movements, framing and Sarah's heightened agitated state of terror elicited a cluster of 'Momentary Fear' level 1-2 responses during 78.0-82.0 seconds, which was 60% of total mediation peaks response during this short sequence. This informs us that for these viewers there were causal links between vicarious, direct and shared suspense sequences that elicited a strong condensed anxiety response at the highest level. Firstly, through the first person POV synchronising vicarious and direct suspense, where the viewer watches the liftgate opening in the rear viewer mirror which Sarah is unaware of. Secondly, direct suspense occurs when the viewer looks at the open liftgate and thirdly, shared suspense is used where the viewer watches Sarah's reactions to these narrative events through close ups and extreme close ups of her face revealing an emotional state of terror.

The discussion will now analyse the main themes taken from viewer feedback comments about *Silent House* and provide sample viewer comments and mediation peak responses. One of the main themes, which accounted for 40% of viewers' comments, refers to viewers anticipating that something bad was going to happen to Sarah. Suspense was created because they shared Sarah's level of knowledge about her situation: they did not know when she would be attacked, by whom and how. Viewers also added that they were waiting for something that was going to jump out behind Sarah or by the side of the car and surprise them. The construction of suspense plays on the viewers' fears of the unknown, even though viewers knew something was going to happen, the plot concealed narrative information, such as the identity of the antagonist and how, where and when someone or something will attack Sarah. Although these comments do not explicitly state that these viewers' empathised with Sarah, their fears and uncertainties centre on Sarah and her vulnerability to attack.

Turning to a sample of viewer comments, viewer 20 (male), who reacted with 'Extended Fear' level 1 response at 11.5 seconds (suspense sequence 1A) and an 'Extended Fear' level 2 at 28.9 seconds (suspense sequence 1B), explained how he felt when watching *Silent House*: 'The look on the girl's face makes me really anticipate...what is it and when is the guy who's trying to attack her going to appear?' This informs us that for viewer 20 he reacted with a string of anxiety responses at high

levels of intensity during the direct suspense sequence at 11.5 seconds (Figure 4.41) and shared suspense sequence at 28.9 seconds (Figure 4.42). His comments also confirm that his anxieties were driven partly by watching Sarah's facial expressions and the thought that she could be attacked by someone at any moment.



Figure 4.41. At 11.5 seconds viewer 20 reacts with an 'Extended Fear 'level 1 response.



Figure 4.42. At 28.9 seconds viewer 20 reacts with an 'Extended Fear' level 2 response.

Viewer 18 similarly explained how the slow camera movement (panning) and angle triggers suspense though anticipation about what Sarah is going to see and that she felt anxious about waiting for something to suddenly jump out on the screen. Viewer 18 (female), reacted with different mediation peaks during the film clip including an 'Extended Fear' level 1 response on 46.0 seconds when the camera starts synchronises vicarious and direct suspense (Figure 4.43), with the camera panning towards the rear view mirror through a slow camera movement while the female protagonist is off-screen:

> It's very intense, the way the slow camera angle's moving. It leaves you anticipating what she's going to see, constantly feeling on edge, waiting for something to jump out…the angles are good, and the darkness, not really being able to see but knowing that there is something there (viewer 18)



Figure 4.43.At 46.0 seconds viewer 18 reacts with an 'Extended Fear' level 1 response.

Viewer 22's (male) mediation peak responses at 12.2, 29.0, 35.2 and 68.0 seconds illustrate the construction of suspense through three different narrative and cinematic techniques. First, by concealing and revealing narrative information, secondly, how the camera cues the viewer through panning and thirdly, the speed of panning. There was an 'Extended Fear' level 2 response at 12.2 seconds, when viewers' attention was directed towards to the liftgate using a slow camera panning technique (10.8-12.2

seconds). The shared suspense sequence during 28.0-35.0 seconds, triggers two 'Extended Fear' level 1 responses, indicating that he experienced a prolonged form of anxiety at a high level of intensity when watching Sarah in distress. When the camera pans towards the liftgate again at 68.0 seconds, with rapid movement combined with the liftgate being open, viewer 22 reacts with a 'Momentary Fear' level 1 response. Viewer 22 describes how the plot reveals and conceals narrative information, which kept him in suspense:

> In the film, she saw the liftgate was open and that was very scary because at the back I couldn't see anything, so I don't know what was there. But, as she turned forward, I was expecting something to appear in front of her, and that kept me in suspense. And nothing did, and that still kept me in suspense. And when the mirror showed that the liftgate was opening more, I felt scared for her because she didn't know it was opening. And she turned around and I thought it was clear again. So I expected her to turn around, and was waiting in suspense for her to turn around. But I think somebody will appear in front of her instead… (viewer 22).

Therefore, viewer 22 describes how the different suspense narrative structures work together to elicit a strong anxiety response at a high level of intensity. He first describes direct suspense in two sequences, when the viewer watches the LCD messages 'the liftgate is open' (5.0 seconds) and then when the camera directs his attention to the liftgate (10.8-12.2 seconds), with him saying he could not see anything there. Secondly, he shares Sarah's anxieties when she first looks out of the windscreen at 35.2 sequence, as he expects something to appear in front of her. Thirdly, when he watches the synchronised vicarious and direct suspense sequence when the camera directs the viewers' attention to the rear view mirror and watches the liftgate opening (45.0-60.0 seconds). Moreover, he describes vicarious suspense that increased his anxieties for Sarah's safety because she did not know the liftgate was open. Fourthly, viewer 22's anxieties were further increased when waiting for Sarah to turn around towards the front of the car again, because he feared that someone may appear and attack her.

The feedback comments from viewers 20, 18 and 22 demonstrate that the construction of vicarious, direct and shared narrative structures were created by the use of camera

shots, framing, movement (panning), direction and by Sarah's reactions, in particular, when narrative information was concealed from either Sarah or viewers. Viewers make specific reference to not knowing the identity of the antagonist and how, when and where an attack would happen, combined with knowing that something will happen to the female protagonist. This approach generated two types of anxiety responses with a high level of intensity. This was shown with the three clusters of 'Extended Fear' level 1-2 responses during the 10.8-12.2 (direct suspense), 28.0-35.0 (shared suspense) and 'Momentary Fear' level 1-2 responses during 76.0-82.0 seconds (shared suspense). The shifts in comparative knowledge between Sarah and the viewer, which correspond to the combination of narrative structures which form composite suspense, map onto viewer mediation peaks and feedback responses.

A good example for measuring shared suspense was demonstrated by the suspense sequence 1B (28.0-35.0 seconds) and during sequence 2 (78.0-83.0 seconds). During these sequences viewers watch a close up of Sarah's facial expressions of fear. Interestingly, the second main theme with 30% of viewers' comments, explicitly refer to their fear being driven by Sarah's facial expressions, creating strong anxiety responses. These viewers' comments combined with mediation peak responses provide further evidence that watching a liked fictional character in distress (with a sustained close up camera shot), who expresses fear and anxiety because they feel vulnerable to attack from an antagonist, helps to build a stronger empathetic viewer response. Viewer 8 (female), who reacted with an 'Extended Fear' level 2 response during suspense sequence 1B at 37.2 seconds explained:

> That was a really good clip. There was a woman in a car, obviously very frightened. And she was parked outside a house, and was obviously worried that there was somebody going to come and get her. And so it was easy to empathise with her because, you know, I can imagine myself in that situation.

Viewer 8 found it easy to empathise with the female protagonist because she could imagine herself being in the same situation and that would be very frightening, which informs us that a fear response when watching a horror film is also determined by how individuals would feel if they were in the same situation. As mentioned previously, the suspense sequence 1B is linked with film sequences 2.0-4.0 seconds

(reversed vicarious suspense), 5.0-10.0 seconds and 10.8-12.2 (direct suspense) and 28.0-35.2 seconds (shared suspense). These suspense narrative structures form composite suspense through a pattern vicarious, direct and shared suspense.

The discussion will now draw on the key findings to explain how *Silent House* composite suspense constructs suspense to maximise shared suspense during suspense sequence 1B and suspense sequence 2. Composite suspense for sequence 1B (28.0-35.2 seconds) was created through a pattern of reversed vicarious suspense (2.0-4.0 seconds), followed by direct suspense (sequence 1A: 10.8-12.2 seconds). Although suspense sequence 1A and 1B combined was 10.8 seconds in duration, these sequences elicited 58.8% of total 'Extended Fear' level 1-2 clusters from the film clip, indicating that these sequences were the most suspenseful. This informs us that viewers were more likely to experience a prolonged anxiety response at a high level of intensity. The first two suspense sequences discussed above, which produced the most suspenseful moments, of the film clip, provide good examples of how the camera cues the viewers via direct suspense with them watching the LCD message 'liftgate open' and watching the closed liftgate. The direct suspense sequences also enable the viewers to be concerned for Sarah's safety. Shared suspense is also maximised using slow camera movements (panning) and close ups of Sarah's face. This involved showing Sarah's facial expressions of fear indicating that someone is going to enter the car through the liftgate and attack her.

Composite suspense for suspense sequence 2 was created in the following ways: firstly, through prior knowledge of what story information had been revealed to the viewer before through suspense sequence 1A and 1B. Secondly, through synchronised vicarious and direct suspense during 45.0-60.0 seconds, thirdly with shared suspense when viewers watch Sarah's reaction to the liftgate being open and fourthly, when the viewers watch Sarah's facial expressions of fear in close up and extreme close up. This was supported by a cluster of 'Momentary Fear' level 1-2 response during 76.0-82.0 seconds, accounting for 60% of total of mediation peak responses during this short sequence, producing a condensed anxiety response at a high level of intensity. Sequence 2 also demonstrated that a repetitive pattern of vicarious and direct suspense

elicited a strong form of shared suspense, by using similar camera cues and Sarah's more intense fear reaction shown through her facial expressions. This, then, supports Susan's Smith's assumption that combining vicarious, direct and shared into a composite form of suspense, maximises viewers' anxieties and suspense. The discussion will now turn to the final narrative structure: vicarious suspense, which is when the viewer has privileged knowledge about the protagonist's situation, but this information is denied to the protagonist.

Vicarious Suspense

Smiths' final form of suspense, vicarious, is constructed when the viewer is privileged with narrative information which threatens the life of a liked fictional character, but the protagonist is denied this information (Smith, S. 2000: 18-20; Hitchock in Truffaut, 1985: 73). This dilemma encourages the viewer to feel anxious for the protagonist's situation, because they appear to be helpless, by being unaware of any danger or unaware of crucial information that would enable them to escape the danger. According to Susan Smith (Smith, S. 2000: 19), because the protagonist is unaware of the danger, the viewer and protagonist do not share the same mental or emotional state. The viewer creates a vicarious viewing position, which can lead to producing a weaker form of suspense. Although Smith argues that vicarious suspense is unlikely to produce a sustained form of suspense as is found in shared or direct suspense (Smith, S. 2000: 19), the results from the film experiment demonstrate that Smith's assumptions are incorrect and that vicarious suspense produced a more sustained form of suspense than shared, direct or composite suspense.

This was demonstrated by clips featuring vicarious suspense generating the highest quantity of 'Extended Fear' level 1 responses, indicating that participants experienced a prolonged form of anxiety with an extremely high level of intensity. For instance, vicarious suspense film clips generated 21.5% 'Extended Fear' Level 1 responses, compared to direct, which had 11.2%, shared with 14.1% and composite with 12.5%. Bearing in mind that 'Extended Fear' level 1 responses accounted for 14% of total mediation peaks across all film clips and narrative structures, vicarious suspense was the only narrative structure to generate 7.5% above the average score. *Quarantine* has

been selected because it produced the highest quantity of 'Extended Fear' viewer level 1 responses and multi-mediation peak responders. Furthermore, *Quarantine* elicited four cluster 'Extended Fear' level 1 responses during the film clip indicating that these viewers experienced a sustained prolonged form of anxiety at the highest level of intensity.

Case Study 4 - *Quarantine*

The *Quarantine* vicarious suspense clip is 40.0 seconds in duration, generating 56 viewer mediation peak responses from 95% of viewers, with 89% of viewers being multi-mediation peak responders, with 22.2% of them reacting with two or more 'Extended Fear' level 1 responses. This was not achieved by any other film clip in the sample. All of the 'Extended Fear' level 1 responses are distributed across four clusters that occurred at 1.0-5.0 seconds, 11.0-14.0 seconds, 20.0-22.0 seconds and 35.0-39.0 seconds. This provides further evidence that viewers experienced a consistent, sustained form of anxiety at the highest level of intensity during the film clip. The discussion for *Quarantine* will focus on the four clusters of 'Extended Fear' level 1 responses, firstly, by describing the film clip setting and each film sequence in order. Secondly, through a textual analysis and then a discussion of the main themes drawn from viewer comments and providing sample viewer comments and their mediation peak responses.

The *Quarantine* setting is in a pitch dark laboratory with two protagonists: a female journalist (Angela Vidal played by Jennifer Carpenter) and male cameraman (Scott Percival played by Steve Harris), who operates a hand held camera with night-vision in order to see in the dark. Both are trapped and isolated in the laboratory with an antagonist (zombie), who is unaware of their presence. The viewer watches the film through the POV of the cameraman through a hand held camera using night-vision. The way the camera positions the viewer can be perceived as a direct form of suspense, because the viewer is watching the film through the eyes of the cameraman, a fictional character. However, the dominant narrative structure is vicarious suspense because the viewer is privileged with information that Angela and the zombie are denied.

Suspense Sequence 1: 1.0-5.0 seconds

In this film sequence the camera shakes intermittently and positions the viewer so they see Angela facing them and looking directly into the camera with complete darkness surrounding her (Figure 4.44). Briefly, Angela moves off screen to the right side of the frame (Figure 4.45), leaving the camera to focus on objects in the distance (Figure 4.46), which is quickly followed by the viewer watching an extreme close up of Angela's mouth. This opening sequence (1.0-5.0 seconds) cues the viewer to ask questions concerning the identity of Angela, what she is doing and what is behind her in the dark. Because Angela moves out of the camera frame briefly to the right and the cameraman pans the camera to the left to see what is behind Angela, viewers are invited to assume something may be hiding in the dark. The close up and extreme close up camera shots of Angela's face initiates an empathetic response from the viewer, especially as the she appears not able to see anything because it is pitch black. The panning away then constructs vicarious suspense by giving the viewer a perspective on the scene that Angela does not have.



Figure 4.44. At 1.0 second, a close up of Angela's chest and showing the darkness surrounding her.



Figure 4.45.At 4.0 seconds Angela moves out of the frame as the camera directs the viewers' attention (direct suspense) to a metal trolley in the distance.



Figure 4.46. At 5.0 seconds Angela moves back into the frame with a close up of her mouth and nose.

In the second film sequence (11.0-14.0 seconds), the viewer is positioned with a close up of Angela, who is situated on the right side of the frame and looking frightened in the direction of the left frame. As she looks downwards, the background behind her is vaguely revealed and shows metal objects in the distance. She then starts to tilt her head upwards at 13.0 seconds (Figure 4.47) with a frightened look on her face, while

at the same time her face moves closer to the camera showing an extreme close up camera shot.



Figure 4.47. At 13.0 seconds, Angela starts to tilt her head upwards with a frightened look on her face.



Figure 4.48. At 14.0 seconds Angela moves to the right of the frame and the zombie (antagonist) appears as a blurred figure in the centre of the frame.

Angela then turns her head facing the direction of the left side of frame and a blurred figure appears in centre frame facing in the direction of the right side of frame. On 14.0 seconds (Figure 4.48), Angela moves off screen to the right of frame, revealing a blurred image of the antagonist (zombie) working by a workbench in the distance. This sequence (11.0-14.0 seconds) reveals to the viewer what is happening behind Angela and, although she cannot see anything, Angela appears to be very anxious and frightened, as illustrated by her facial expressions of fear. When she turns her head in the direction of the left frame, this cues the viewer that something could appear in that direction. A blurred image of a human leg in the distance (centre frame) then appears, followed shortly afterwards by a blurred image of the zombie appearing in the distance. Seconds later, Angela moves off screen to the right of frame with the camera focusing on the zombie on his workbench. The appearance of the zombie in the distance combined with the zombie being content working at his workbench in pitch darkness cues the viewer that the zombie is not far away from Angela and that the zombie is not aware of her presence or location.

Suspense Sequence 2: 11.0-14.0 seconds

This film sequence provides a complex example of vicarious suspense, where the viewer is privileged with narrative information about Angela and the zombie that both are denied. First, the viewer can recognise that the antagonist looks like a zombie and his location in the dark space, knowledge that is denied to Angela. The viewer can also see Angela and where she is located, knowledge denied to the zombie. Thus, vicarious suspense is generated by this uneven distribution of knowledge between the viewer, Angela and the zombie. The zombie is a clear threat to Angela because he is not far away from her, but she cannot escape because she cannot see anything. This dilemma is further emphasised with the cameraman being privileged with the knowledge about the zombie, just like the viewer, but unable to tell Angela what is happening, as any noise will allow the zombie to find them.

Whilst the sequence attempts to construct shared suspense between the viewer and cameraman, the viewer cannot see his emotional state and the narrative prominence of Sarah means that the dominant structure is one of vicarious suspense. For the duration

of the 40.0 second film clip, the cameraman plays the role of the observer (like the viewer) rather than being active in the story world, which makes it very challenging for the viewer to empathise with him when they cannot see or hear him. Instead, the camera is focussed on a continuous stream of close ups and extreme close ups of Angela's frightened face, which dominate the film clip. Therefore, in this film sequence, the plot reveals crucial information to the viewer designed to increase their anxieties and concerns for Angela's survival.

Suspense Sequence 3: 20.0-24.0 seconds

In the third film sequence, the viewer is positioned with the cameraman's hand held camera, watching Angela's face in close up on the right side of the frame with her face tilting downwards (Figure 4.49). The viewer briefly watches a human leg (zombie) move in the distance behind Angela, which is synchronised with her moving her face closer to the camera and tilting her face upwards with a frightened expression. Then on 21.0 seconds (Figure 4.50), Sarah moves her head to the right side of the frame so she is looking directly into the camera, synchronised with the zombie appearing in the centre of the frame in the distance, facing in the direction of the right frame, holding a hammer in his right hand. This is followed by an extreme close of Angela's face as she moves closer to the camera on 24.0 seconds (Figure 4.51).



Figure 4.49. At 20.0 seconds the viewer watches a close up of Angela's frightened face.



Figure 4.50. At 21.0 seconds the viewer watches a close up of Angela's frightened face and the zombie in the background with a hammer in his hand.



Figure 4.51. At 24.0 seconds the viewer watches an extreme close up of Angela's face with the zombie in the background unaware of her presence.

This very short film sequence (20.0-24.0 seconds) reveals a serious threat to Angela's life, with the zombie in the distance holding a hammer behind her, while she exhibits

facial expressions of fright. Again, an imbalance in knowledge aims to create vicarious suspense for the viewer. This combination of narrative elements elicits suspense because the zombie is still unaware of Angela and Scott's (cameraman) presence and the zombie could stumble across them at any moment and attack them with a hammer.

Suspense Sequence 4: 35.0-39.0 seconds

In the fourth film sequence, the camera positions the viewer watching a close up of Angela's face on the right side of the frame with her looking frightened and desperate to scream. Suddenly on 36.0 seconds (Figure 4.52), the zombie appears behind Angela holding a hammer, which is shown using a low angle camera shot that informs the viewer that Angela and Scott are kneeling on the floor, making them very vulnerable if the zombie launches an attack. The zombie continues to move slowly towards Angela and this is synchronised with her moving closer to the camera capturing extreme close ups of her face as the zombie moves his hand forward in her direction; then the zombie moves his hand backwards on 38.0 seconds (Figure 4.53), followed by an extreme close up of Angela's face. On 39.0 seconds the zombie reaches towards Angela.



Figure 4.52. At 36.0 seconds the zombie moves closer to Angela, unaware of her presence and she knows someone is there but not their exact location.



Figure 4.53. At 38.0 seconds shows an extreme close up of Angela's face and hand

The fourth film sequence (35.0-39.0 seconds) creates vicarious suspense through the zombie appearing from behind Angela and walking slowly in her direction with a hammer in his left hand. This sequence also reveals more detail of the zombie's appearance, while at the same time concealing his identity with his upper body not being revealed to the viewer due to the darkness. Combining the zombie's actions in moving closer to Angela with her suppressing a scream, intensifies the tension and suspense in the film sequence. Furthermore, with the cameraman kneeling on the floor, the camera positions the viewer from a low camera angle so they are looking up at the zombie making him appear dominant. This technique is explained by Blain Brown:

> With low angles, the subject tends to dominate us. If the subject is a character, that actor will seem more sustained and dominant. Any time the actor being viewed is meant to be menacing or frightening to the character we associating the POV with, a low angle is often appropriate (Brown, 2012: 65)

This fourth sequence continues the clip's overall structure of vicarious suspense, privileging an imbalance in knowledge between the viewer and the visible on screen characters. The discussion will now turn to the main themes drawn from viewer comments, which will be supported by a sample of viewer comments regarding how the *Quarantine* vicarious narrative structure clip constructs suspense. These comments will be accompanied by viewer mediation peak responses, to gain a more in-depth

understanding of *Quarantine's* use of vicarious suspense. There were two clusters of viewer 'Extended Fear' level 1 responses during 1.0-5.0 seconds and 11.0-14.0 seconds accounted for 44.4% of 'Extended Fear' level 1 responses. Combining this data with 71.4% of multi-mediation peak responders during 1-13 seconds, indicates that these viewers experienced a sustained form of anxiety at the highest level of intensity before the first appearance of the zombie on 14.0 seconds.

This demonstrates that viewer anxieties were driven by them not being able to see what was happening behind Angela in the opening 13.0 seconds of the clip. Therefore, the construction of suspense during 1.0-13.0 seconds was created by the plot concealing the identity of who or what was moving in the background, synchronised with revealing narrative information to the viewer that invited viewers to think someone or something sinister is in the background threatening the life of Angela. The importance of who has narrative knowledge continued throughout the remainder of the clip. The theme that recorded the highest score, with 40% of viewer comments, refers to the zombie's movements behind Angela and the fact that she cannot see in the dark resulting in viewers feeling very tense and scared, because they did not know what was going to happen, even though something could be seen moving in the distance. The responses, therefore, correspond with the Susan Smith's definition of vicarious suspense.

Viewer 2 (male), reacted with an 'Extended Fear' level 4 response at 7.0 seconds, which had a rise time duration of 13.7 seconds. This was the longest rise time from all viewer mediation peak responses to the film clip. Viewer 2 explained how the film clip created suspense through vicarious suspense by concealing narrative information from Angela even though she knows that something is happening behind her.

> Really high suspense scene, just the fact that there's no light in the room and you're seeing everything from a night vision lens. Also the fact that the person knows there's something going on behind them but can't see anything. And your viewing angle is what she can't see, rather than what she can see is what technically is behind you. (Viewer 2)



Figure 4.54. Viewer 2 reacts with an 'Extended Fear' level 4 response at 7.0 seconds and experiences a very durable form of anxiety (rise time duration 13.7 seconds).

Viewer 11 (female), who reacted with six 'Momentary Fear' level 3-4 responses during the film clip, also described how creepy and scary it was watching the zombie wander around in the background. She explained that '…the way that she had her back towards the creepy thing was quite scary, because he was just wandering around in the background'. The comments from viewers 2 and 11 inform us that the key principles of vicarious suspense made the film clip scary, such as how the zombie moving in the background behind frightened Angela with her being unaware of the zombie's location.

The second theme concerned empathy for the protagonist, with 36.4% of viewers' comments explicitly stating that they were frightened for her. This empathetic response towards Angela was driven by viewers watching close up and extreme close up camera shots of frightened Angela, twinned with their knowledge that she was vulnerable to attack from the zombie. For example, viewer 5 (female), reacted with an 'Extended Fear' level 4 response at 13.3 seconds and an 'Extended Fear' level 1 response on 35.2 seconds (Figures 55-57), and explained how tension and suspense were generated by Angela's facial expressions of fear and that for her survival she had to keep quiet even though she was fearful of being suddenly attacked by the zombie:

> … I think that the most stressful thing was the fact that she was having to be so quiet. Because you could see so clearly on her face that she wanted to scream, or shout, or just cry, or something. And it was really tense watching her not be able to do it. And, sort of, you couldn't really see what was going on in the background (viewer 5)

Viewer 5 described that anxiety and tension were created by Angela having to keep quiet to survive because any sound will alert the zombie of her presence and she will be attacked. The greater knowledge given to the viewer of the zombie's location was twinned with empathy for Angela's need to remain silent. Another aspect that created an intense form of anxiety is that viewer 5 could not see what was happening in the background and infers that this would be where a threat to Angela's life would appear. This indicates that concealing the identity and location of the zombie also was important to the construction of suspense even though the viewer knows that something was lurking in the dark because of Angela's highly stressed reaction.



Figure 4.55. At 13.3 seconds viewer 5 reacts with an 'Extended Fear' level 4 response.



Figure 4.56. At 35.2 seconds viewer 5 reacts with an 'Extended Fear' level 1 response.

The way in which Angela moves her face closer to the camera lens during the film clip elicits viewer suspense, because the viewer is being kept constantly aware that she is terrified of being attacked. This informs us that the construction of suspense operates through movements in the background, which initially conceal the antagonist's identity from the viewer, even though they know someone is in the dark. Suspense is heightened when the plot reveals to the viewer, but denies to Angela, the antagonist's identity and location on 14.0 seconds, which is combined with the antagonist not being aware of Angela or Scott's (cameraman) presence during the film clip. Therefore, viewers' anxieties from 14.0 seconds into the film clip are driven by Angela's facial expressions of fear and vulnerability to attack from the zombie, which encourages viewers to empathise for her situation. As mentioned previously in the *Silent House* composite suspense, viewers are more likely to empathise with a liked fictional character who shows facial expressions of fear because viewers empathise with fictional characters emotional states through their facial expressions (Kydd, 2011: 120). Here, this empathy contributes to the construction of vicarious suspense, enhancing the imbalance in knowledge between viewer and protagonist. What is interesting about the way vicarious suspense invites viewers to empathise with Angela, is that this form of vicarious suspense in *Quarantine* is synchronised with shared suspense, because the viewer fears for Angela's safety and she is aware that

her life is being threatened by an antagonist (shared suspense), whose identity or location have not been revealed to her (vicarious suspense).

The third theme refers to viewers' fears concerning the zombie appearing from behind Angela with a hammer (a lethal weapon), which made viewers feel the direct threat to Angela, especially when the zombie almost touches her at the end of the film clip. Considering viewer 'Extended Fear' level 1 responses during 14.0, 20.0-22.0 and 35.0-39.0 seconds, when the zombie appeared on screen behind Sarah, combined with the female protagonist close up or extreme close up camera shots, 55.6% of 'Extended Fear' level 1 responses were generated, demonstrating that when viewers could see the zombie and its location behind Angela, combined with her being aware something dangerous is nearby, but not knowing the identity or location of the zombie, produced a prolonged form of anxiety at the highest level of intensity. Viewer 22, a multi-mediation peak responder, reacted with three 'Extended Fear' responses: level 4 at 14.9 seconds, level 3 at 22.8 seconds and level 1 at 31.6 seconds (Figures 57-59). These mediation peak responses indicate that they experienced a prolonged form of anxiety with increasing intensity level as the film clip progressed, with maximum anxiety response experienced at 31.6 seconds, when the zombie appears behind the female protagonist.



Figure 4.57. At 14.9 seconds viewer 22 reacts with an 'Extended Fear' level 4 response.



Figure 4.58. At 22.8 seconds viewer 22 reacts with an 'Extended Fear' level 3 response.



Figure 4.59. At 31.6 seconds, viewer 22 reacted with an 'Extended Fear' level 1 response.

Viewer 22 explains how the camera positions the viewer makes it scary when watching the frightened Angela, and with the zombie appearing behind her with a hammer:

> …I couldn't see everything. Could only see what the camera was pointing to and that made it very scary. And I could see the fear in the girl's face. And there was complete silence again. In the background I could see someone's feet moving. And then later on as she moved closer I could see it's a monster, I would say. And it was getting closer to her, and I was not sure whether she was going to hit her with the hammer or was she going to just walk past her. And it felt very scary (Viewer 22)

In regard to viewer 22's comments, they reflect those of viewer 5 about the narrative conflict with Angela wanting to scream yet having to remain quiet to survive. In regard to the plot concealing and revealing narrative information to the viewer that is denied Angela and antagonist (zombie), then this can be described in two layers. The first layer refers to the viewer being privileged with information about the zombie's identity and that he is holding a hammer and the viewer also knows how close the zombie is in relation to Angela. This information is denied to Angela, even though she can hear sounds nearby and, therefore, she does not know who the antagonist is, that he is a zombie (antagonist appearance), his location and that he is carrying a hammer.

The second layer increases viewers' anxieties because the viewer is also privileged with information about Angela and her location, which is denied the zombie. Suspense in this instance is constructed with the plot revealing to the viewer the identity and location of both Angela and zombie, which generates high levels of anxiety and a sustained form of suspense because the viewer is on tenterhooks as to whether the zombie will find Angela either by her screaming, making a sound or that the zombie will stumble into Angela and launch an attack on her.

Viewer 17 (female) reacted with six mediation peaks including an 'Extended Fear' level 1 response on 21.7 seconds (Figure 60). She explained how the zombie getting closer to Angela was very scary:

> Don't like the thing getting closer and closer to her. She's trying her hardest not to scream. I felt a little bit anxious knowing that he's getting closer to me and he's going to touch me in a minute, as if I were her. My heart started going a little bit, I think mainly because you don't know what that thing is or what it's going to do to you (viewer 17)

For viewer 17 (female), suspense is not constructed in isolation through textual elements, instead the narrative awakens the viewer's own fears. In this instance, viewer 17's anxieties are driven by her fear of what things the zombie could do to her and that he is going to touch her.



Figure 4.60. At 21.7 seconds viewer 17 reacts with an 'Extended Fear' level 1 response.

She even comments on vicariously feeling for Angela, as if the zombie was about to touch her, rather than the on screen figure (Angela), which indicates that viewer 17 experienced a form of narrative transportation (Green & Brook 2000: 701). Viewer 17's comments demonstrate how a viewer's fears of being attacked can be elicited by the narrative structure and enabling the viewer to become more absorbed into the story world, living their own fears vicariously through a fictional character.

Quarantine's use of vicarious suspense provides a complex vicarious narrative structure, where the construction of suspense is created through three main narrative elements. First, the viewer is privileged with crucial narrative information that Angela

and antagonist are denied. Secondly, the camera positions the viewer so they watch the frightened Angela in close up (and extreme close up shots), combined with her need to be silent to survive and that any attempt to escape will result in a fatal attack being by the zombie. Thirdly, through the ambiguous nature of the zombie moving behind Angela in the dark, then appearing behind her and walking close to her. However, one of the main insights into *Quarantine's* vicarious suspense is how these vicarious narrative elements mentioned above are synchronised with shared suspense, where the viewers' mental and emotional responses are aligned with the female protagonist. This is particularly emphasised by the close ups and extreme close ups of Angela's facial expressions of fear and terror and demonstrates how the viewer is positioned in relation to the framing of Angela increases viewer empathetic response for her.

Moreover, vicarious suspense synchronised with shared suspense in *Quarantine* elicited a much strong anxiety response that when vicarious suspense was synchronised with direct suspense in *Silent House,* as demonstrated by *Quarantine* eliciting 50% more 'Extended Fear' level 1 responses. However, what is most interesting is that in both instances, vicarious suspense was fused with direct or shared suspense, producing a hybrid form of vicarious suspense. These hybrid suspense narrative structures are different to composite suspense based on Susan's Smith's definition (Smith, S. 2000: 24), which was discussed earlier in the direct suspense section. A hybrid form of suspense occurs when either vicarious, direct or shared are synchronised at the same time as another narrative structure e.g. vicarious with direct or shared suspense. A composite form of suspense is when the suspense narrative structures work together side by side which was well demonstrated in the *Silent House* composite clip. These findings from *Silent House* and *Quarantine* inform us that not only do vicarious, direct and shared suspense work in isolation and alongside each other, but also they can be fused together, providing a stronger form of suspense.

In regard to the narrative element dilemma about whether a direct form of suspense was created with Scott (cameraman) and his hand held camera and whether viewers empathised with Scott, viewer feedback never mentioned him, although viewers were

well aware the film clip was filmed using a hand held camera with night-vision and presumably by a fictional character. In addition, no viewer mentioned that the hand-held camera positioned the viewer in the first person POV, so we can conclude from this that direct suspense was not synchronised with *Quarantine's* vicarious suspense narrative structure. Although it is quite clear from the evidence of viewer responses that *Quarantine's* vicarious suspense produced a strong form of suspense, there are clear signs to indicate that lighting, sound and mise-en-scène also played a role in the construction of suspense and, therefore, *Quarantine* vicarious suspense will be a case study in the following chapter, which analyses cinematic techniques through two overarching themes: Concealing, delaying and revealing story information and the construction of empathy.

Conclusion

This chapter demonstrates how the EDA model of suspense can measure suspense narrative structure and viewer experience, in particular to locating the most suspenseful moments of a film clip in terms of anxiety durability and intensity level. When considering viewer mediation peak responses across all narrative structures, vicarious suspense was the most successful in producing a prolonged anxiety response at the highest level of intensity with 21.3% of total mediation peaks being 'Extended Fear' level 1, compared to 14.1% shared, 12.5% composite and 11.2% direct. Although these findings provide evidence to support Alfred Hitchcock's assumption that vicarious suspense is the most effective suspense narrative structure to generate high levels of anxiety, when vicarious suspense is fused with shared suspense, the viewers experienced an even more powerful form of suspense. *Quarantine* was the only film clip in the film experiment that had a hybrid form of vicarious and shared suspense and was the most successful film clip to produce a sustained anxiety response at the highest level.

Moreover, 77.7% of repeat viewers reacted with 'Extended Fear' level 1 responses, demonstrating that viewers were also more susceptible to react to a fear stimulus in horror films on repeat viewings, which contradicts assumptions made by film theorists

that because uncertainty is essential for suspense to occur (Uidhir, 2011), viewers cannot experience suspense on repeat viewing. Although direct, shared and composite suspense narrative structures did produce a heightened level of suspense intermittently, they were not as consistent in eliciting a prolonged anxiety response at the highest level of intensity as vicarious suspense.

When considering the popular film theory that the construction of suspense is generated by the viewer empathising with a liked fictional character whose life is threatened by an antagonist (Carroll, 1996; Kydd, 2011; Smith, S. 2000; Zillmann, 1994;), all four case studies presented different ways for the viewer to develop an empathetic response with a female protagonist. *Quarantine's* vicarious suspense and *Silent House's* composite suspense invited viewers to empathise with a female protagonist through close up or extreme close up camera shots of her face, allowing the viewer to understand the female protagonist's feelings and emotional state (Barsam, 2007: 163; Kydd, 2011: 120). *Quarantine* and *Silent House* developed a strong empathetic response for the protagonist in different ways. *Quarantine* used a hybrid form of vicarious-shared suspense to create a strong empathetic response for Angela. Whereas *Silent House* used a hybrid form of vicarious-direct suspense combined with a composite comprising of vicarious, direct and shared suspense working alongside each other. When considering viewers comments which explicitly stated that they empathised with the protagonist, *Quarantine* vicarious suspense achieved the highest score of 36.4% followed by *Silent House* composite suspense at 30%, *Grave Encounters 2* with 25% and finally *The Descent* with 10%, even though in *The Descent*, viewers had a choice of empathising with either one or both female characters.

In the *Grave Encounters 2* clip, direct suspense attempts to develop viewer empathy with the viewer watching the film clip through Tessa's POV and hand held camera. Although, as Tessa's physical identity is never revealed to the viewer, the natural way viewers empathise through facial expressions is disrupted (Caes et al. 2012: 476; Kydd, 2011: 120), so the viewer is forced to empathise through Tessa's camera movement, dialogue and footsteps. *The Descent* clip's use of shared suspense attempts

to create an empathetic response through Rebecca and Sam, her colleague, who attempts to escape a zombie and, later, with Rebecca in battle with the zombie. However, neither female character had similar close up nor extreme close up camera shots during the film clip to create a sustained shared suspense response as was found in *Quarantine* vicarious suspense or *Silent House* composite suspense. For *The Descent*, viewers found it challenging to overcome the barriers to developing empathy for Rebecca because of the high frequency of jump cuts during the fight sequence, which made some viewers feel disoriented, creating poor story comprehension and, consequently, diminishing suspense. In regard to *Grave Encounters 2*, although the viewer did not see Tessa's identity, some viewers empathised with her through dialogue, footsteps and the way she controlled the viewer's position to the story world through her POV and camera movements.

Another important finding is that when the plot conceals or reveals story information to either the fictional characters or viewers, then viewer suspense can increase or decrease across all narrative structures. For example, when the plot conceals the identity and location of the antagonist, viewer suspense is constructed by playing on viewers' imagination and fears about the antagonist. For instance, in *Silent House* viewers were anxious about not only discovering the antagonist's identity but also that the antagonist would surprise them by jumping up in front of them on screen and scaring them. However, *The Descent* provides a good example of how concealing narrative information can also have a serious impact on story comprehension and suspense. In this case it was through an excessive use of jump cuts, which produced a defective fabula, causing some viewers to feel disorientated and making it difficult for them to make assumptions about narrative events. However, when plot development conceals narrative information, such as the antagonist's identity, then this produces high levels of anxiety and a sustained form of suspense as shown in *Quarantine* vicarious and *Silent House* composite suspense.

Interestingly, the construction of suspense through the plot concealing or delaying narrative information from the viewer contradicts Alfred Hitchcock's assumption that the viewer must always have all the facts for suspense to occur: 'In the usual form of

suspense it is indispensable that the public be made perfectly aware of all of the facts involved. Otherwise there is no suspense' (Truffaut, 1985 : 73). Based on the evidence from the EDA model of suspense, it is essential that narrative elements relating to the antagonist be concealed or delayed from the viewers for them to experience high levels of anxiety and suspense. Whilst narrative elements concerning the protagonist need to be revealed to the viewer so that the viewer can experience their pain and suffering vicariously through the protagonist. This means that suspense narrative structures are nuanced with plot development and cinematic techniques, in particular how the plot conceals, delays and reveals narrative information to the viewer. This now brings us to the next chapter where the EDA model of suspense will be used to analyse how cinematic techniques construct suspense and viewer experience.

CHAPTER 5
Psychophysiological Suspense: Cinematic Techniques

Although the four suspense narrative structures (vicarious, direct, shared and composite) discussed in chapter 4 provide different story frameworks to construct suspense in horror films, narrative structures rely on cinematic techniques to bring these story frameworks to life. In this chapter the EDA model of suspense will be used to analyse viewer responses to the following cinematic techniques: cinematography, sound and mise-en-scène. Cinematography defines what story information is presented on screen and how by the type of camera shot, duration and lighting. For example, as already discussed, in the context of a horror film the camera shot 'dutch angle' or 'dutch tilt' is used to elicit anxiety and suspense by skewing the horizontal and vertical axis of objects in the frame (Brown, 2012: 66). Camera angles can also make the antagonist appear more threatening when using a low angle shot looking upwards at the antagonist's face (Brown, 2012: 65). Turning to lighting, low-key lighting is synonymous with horror and suspense films because it creates a strong contrast between a bright light source and the dark (Barsam, 2007: 152), which produces well defined dark shadows that cue the viewer about potential unknown hidden dangers (Eitzen, 2010).

According to Peter Hutchings 'horror is primarily a sound-based medium' (Hutchings, 2004: 128), with the musical 'stinger', which can act as a startle stimulus, being an integral component of fear in horror films (Halfyard, 2010: 21-22). The 'stinger' is a brief rupture of loud discordant noise that acts as a direct threat towards the viewer, often making the viewer jump from their seats (Hutchings, 2009: 221-222). Turning to mise-en-scène, it creates the mood and atmosphere of what we see and hear on screen (Barsam, 2007: 92). In the context of a horror film, mise-en-scène would include creating an environment that appears frightening and threatening. In this chapter mise-en-scène will focus on the following elements that trigger a fear response in viewers: protagonist and antagonist position and movement in the frame, two protagonists with blood stained clothing (costume) and the facial make-up of two antagonists. This summary of cinematography, lighting, sound and mise-en-scène illustrate how each cinematic component offers its own unique contribution to elicit suspense in horror films. The EDA model of suspense will focus on how these cinematic techniques elicited suspense through two themes. The first theme is how

lighting and sound constructs suspense by creating a narrative imbalance between the viewer and fictional characters by concealing, delaying and revealing story information to the viewer. The second theme analyses cinematic techniques that play a significant role in developing shared emotion and an empathetic connection between the viewer and protagonist. Although the analysis in this chapter focuses on cinematography, lighting, sound and mise-en-scène, editing will also be discussed where appropriate. We shall now turn to the first theme, lighting and sound**.**

Theme 1: Concealing, Delaying and Revealing Story Information

The construction of suspense in horror films occurs when specific story information is concealed, delayed and revealed to the viewer and/or characters with the sole purpose of eliciting a strong anxiety response in the viewer, character or both. For example, the concealment of story information is instrumental in the way suspense is constructed in the narrative structure of vicarious suspense (see chapter 4). However, a formal analysis of the film clips reveals how the same approach may appear within other narrative structures. Furthermore, the research findings from the film experiment found that lighting and sound are key cinematic techniques in constructing suspense in this way. Therefore, I will analyse how lighting constructs suspense by concealing, delaying or revealing story information through the use of darkness and shadows or high intensity lighting. I will focus on sequences from *Quarantine* and *Silent House* that relied on vicarious and direct suspense, respectively.

The second section to theme 1 will analyse how sound constructs suspense by concealing or delaying story information using diegetic off-screen sounds and revealing story information to the viewer through diegetic sounds such as dialogue and non-diegetic sounds such as the music score. This will involve the analysis of aural sequences from the *Sinister* composite suspense clip and the *Silent House* direct suspense clip. A brief description of each film clip will be provided as a reference to the story context of each film clip. We shall now turn to an introduction to lighting in horror films and the parameters of lighting that will be used in the analysis of the case studies.

Lighting

As mentioned previously, to generate tension and suspense in horror films, shadows and darkness are emphasised using low-key lighting (Kydd, 2011: 116; Barsam, 2007: 152). This enables filmmakers to conceal and delay narrative information from the viewer and draws their attention to potential dangers hidden in the dark shadows. The dark attempts to increase viewers' anxieties by playing on their imagination of what they cannot see and builds expectations or/and assumptions of what dangers are hiding in the dark. In addition, the illumination of a bright light source can also elicit suspense when the light is focused on the protagonist's face when their life is being threatened by an antagonist. This is because the bright light reveals the protagonist's emotional state through their facial expressions (Kydd, 2011: 120), which elicits a fear response in the viewer through vicarious conditioning (see chapter 1). The analysis of lighting will be defined by three parameters:

1. *Light brightness* will be described in terms of intensity level of low, medium and high.
2. The *quality of light* will be described as either a hard light that creates sharp well defined shadows or a soft light with diffused shadows.
3. The *colour of light* and how colour effects the *brightness* and *quality of light.*

The *Silent House* direct suspense clip will be the first case study. This clip uses a repetitive pattern of a bright light hard white light with high intensity and dark shots, which was found to be less successful in constructing suspense compared to *Quarantine's* vicarious suspense clip, which demonstrated how the contrast between light and dark within the same frame elicited a more powerful form of suspense.

Case Study 1 - *Silent House* direct suspense

The story involves a protagonist called Sarah played by Elizabeth Olsen, who uses a bright camera flash of white light from a Polaroid camera to see in the dark and search a house. Using the Polaroid camera to see in the dark, Sarah takes three photographs that appear on screen and reveal to viewers what she is looking at when walking in the dark house. The first photograph reveals an empty bathroom and the second, a young girl standing in a hallway, with the third being a room with a pool table. Towards the end of the film clip, directional lighting attached to a camera reveals a moving image

of a man running towards Sarah and appearing to attack her. The film clip is 37.4 seconds in duration and uses dark shots to conceal visual narrative information from the viewer by showing a black screen for 86.4% of the film clip duration. These periods of darkness are punctuated on three occasions by a bright flash of high intensity hard white light from the Polaroid camera that reveals one of the three photographs mentioned above. The combined duration of the camera flash of light and the following photograph appearing on screen is 0.44 seconds. The analysis will focus how dark shots construct suspense by concealing story information from the viewer and how the bright flashes of light of high intensity hard white light reveal story information to the viewer and the character of Sarah.

Table 1 provides a running order by time concerning the bright flashes of light of high intensity hard white light from the Polaroid camera and contrasting shots of dark.

Time (seconds)	**Camera Shot Type**	**Image Description**
0.2	Polaroid Camera Flash (1)	Empty bathroom
0.6-18.1	Dark (1)	Black screen
18.2	Polaroid Camera Flash (2)	Young girl standing in a hallway
18.7-23.2	Dark (2)	Black screen
23.3	Polaroid Camera Flash (3)	Pool table in room
23.8-34.0	Dark (3)	Black screen
34.1	Polaroid Camera Flash (4)	Moving image: Man attacking protagonist, Sarah.
34.6-37.4	Dark (4)	Black screen

Figure 5.1. Table 1 - Silent House direct suspense camera shots and story information.

The bright flashes of light act in two ways. First, as an editing transition between two dark shots to reveal a photograph (still image) on screen and, secondly, as a startle

stimulus to warn the viewer that they will see a still image appear on screen in an attempt to scare them. However, the most suspenseful segment of the film clip was defined by viewer mediation peak responses as between the first camera flash and the second, with 78.8% of total 'Extended Fear' level 1-2 responses occurring during the 4.7-16.0 seconds. This indicates that these viewers experienced a prolonged anxiety response at a high level of intensity when the screen was black and no visual story information was present.

Darkness

The film clip starts with the viewer watching the point-of-view (POV) of Sarah, who is using a Polaroid camera to see in the dark. The first bright flash of white light occurs at 0.2 seconds into the film clip, revealing to the viewer a still image of an empty bathroom. The bright flash of white light attempts to construct suspense by startling the viewer and by revealing briefly what Sarah has seen when walking in a dark house. The first period of darkness occurs during 0.6-18.2 seconds, which invites the viewer to use their imagination to fill in the visual narrative gaps and ask questions, such as: who is Sarah and why is she using a Polaroid camera to see in the dark? Viewers are also prompted to make assumptions about possible future narrative events, such as what will appear on screen, where and when. This dark shot, then, attempts to construct suspense by increasing viewer anticipation and anxieties that another still or a moving image will suddenly appear on screen and scare them.

As mentioned previously, many viewers who reacted with a mediation peak response experienced a powerful anxiety response, which was supported by viewer feedback comments, with 65% making an association between the dark screen and feelings of 'anticipation', 'fear' and 'tension'. For example, viewer 22 (male) who was a multi-mediation peak responder, reacted with two 'Extended Fear' responses during the sequence, with level 2 intensity at 4.9 seconds and level 1 intensity at 10.3 seconds. This indicates viewer 22 experienced a prolonged anxiety response with increasing levels of intensity during the most suspenseful segment of the film clip during the dark shot. Viewer 22's feedback comments underscore his mediation peak responses as he explains: 'OK. In this film there was complete darkness, so I that caused fear because

I didn't know what was going on.' Viewer 22's comments support the textual analysis that when a dark screen conceals visual story information from the viewer they are more likely to experience a fear response.

Viewer 2 (male), who reacted with an 'Extended Fear' level 1 response at 13.1 seconds, provides a similar point of view to viewer 22's feedback comments by stating that the dark shots during the film clip were the most suspenseful and scariest moments:

> It really does seem that the thing that generates the most suspense for me is the pitch black room where you're only every so often getting the image of what's in front of you…And the fact that everything's pitch black and you can't see anything at all is quite terrifying (Viewer 2).

Both viewer 2 and 22's comments demonstrate that when the dark concealed story information, it was terrifying or created a sense of fear because of the unknown dangers that could be lurking in the dark. Viewer 18 (female), who reacted with an 'Extended Fear' level 1 response on 4.7 seconds during the first period of darkness, explains how anticipating what will appear on screen created a strong fear response:

> ...it's just the darkness that gives you the fear anyway. And to have a small flash and a glimpse of what's there, and then all of a sudden something's very close to you, it makes you feel really tense and scared of what's going to happen next (viewer 18)

For viewer 18, the construction of suspense was created through the combination of the dark concealing story information and her anticipating that the next bright flash of white light would reveal story information that would make her feel scared. Moreover, she perceived the bright flashes of white light as a warning to her that the following image on screen would represent a direct threat towards her.

Although the segment of 4.7-16.0 seconds was successful in eliciting a prolonged anxiety response at a high level of intensity, 'Extended Fear' level 1-2 responses suddenly declined after 16.0 seconds. This informs us that 2.2 seconds before the second bright flash of light with high intensity hard white light at 18.2 seconds, the dark shots become less successful in maintaining a prolonged anxiety response at a high level of intensity. This decline in viewer anxiety is further demonstrated during

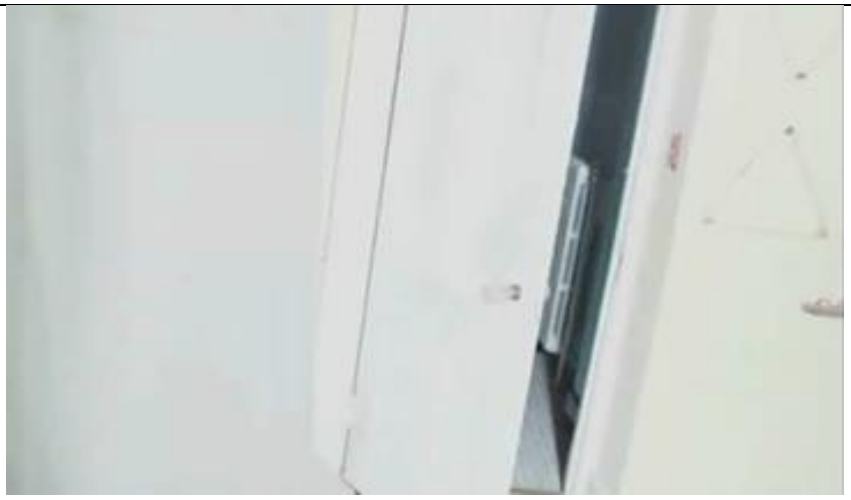
the 3 remaining dark shots (Figure 5.1), which elicited only 21.4% of total 'Extended Fear' level 1-2 responses and during the last two dark shots (3 & 4). This indicates that the dark shots 2, 3 and 4 were not as successful at eliciting a prolonged anxiety response at a high level of intensity when compared to the first dark shot during 4.7-16.0 seconds.

Furthermore, 80% of total mediation peaks during 16.0-37.4 seconds were 'Momentary Fear' responses with the majority being levels 3-4 of intensity. This tells us that viewers were more likely to experience a condensed anxiety response at a medium or low level of intensity between 16.0-37.4 seconds of the film clip. The key reasons why the repetition of the dark shots declined in eliciting a strong anxiety response is because viewers watch a dark screen for 86.4% of the film clip, which means they have to rely on sound to understand the story context of the film clip. Sarah, the protagonist, is also off-screen during the whole film clip, making it more challenging for the viewer to visually understand her predicament and the threat posed by an unknown antagonist during the film clip. This was supported by viewer comments who were often were guessing at was happening and that: 'It was pitch black and so you had no idea what was going on' (viewer 7). Although a dark shot successfully constructed suspense by concealing or delaying story information to the viewer during the 4.7-16.0 second film segment, when dark shots are prolonged or are repeated, they appear to have a negative impact on the construction of suspense. This informs us that the use of complete darkness cannot alone sustain a strong form of suspense and if the viewer does not have sufficient visual story information suspense diminishes. For example, if the viewers watched Sarah on screen at some point during the film clip, they would access Sarah's visual cues to enable the construction of suspense more easily, because they would know more about what she was scared of when walking in the dark house.

Bright Flashes of Light

The role of light can be considered by turning to the Polaroid camera, with its three bright flashes of light with high intensity hard white light that reveal story information to the viewer and Sarah in the form of a still image (Figure 5.2). The bright flashes of

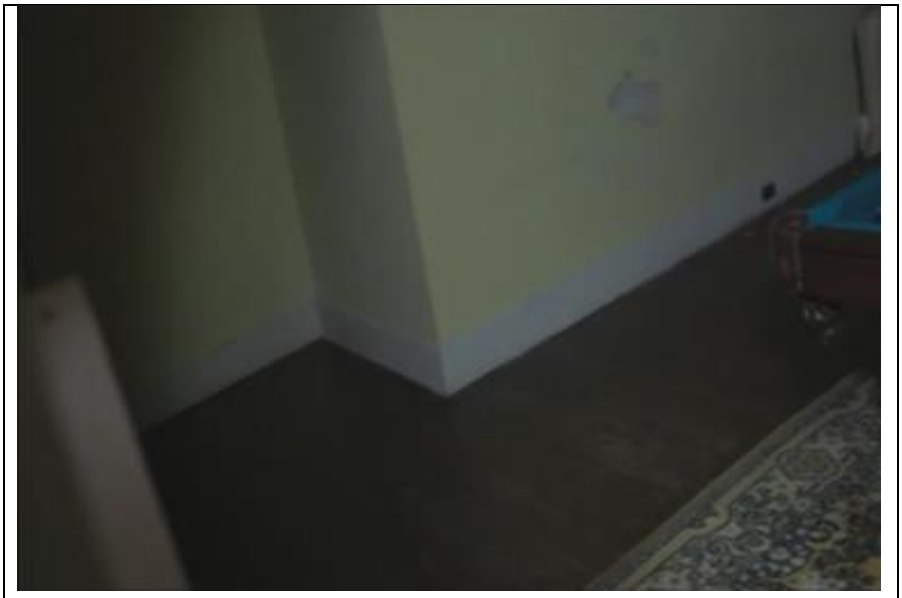
light attempt to construct suspense by revealing story information in the following ways: firstly, as a transitional edit between a dark shot and a shot showing a still image of screen. Secondly, the 0.44 seconds' duration of the bright flashes of light attempt to increase the pace of the narrative that is often achieved through the intercutting of different shots (Sijll Van, 2005: 72). Thirdly, the bright flash of light acts as a startle stimulus in an attempt to warn the viewer that an image will be revealed on screen that will scare them. Fourthly, through the combination of intermittent flashes of light and dark shots.



The empty bathroom at 0.2 seconds



The young girl standing in the hallway at 18.2 seconds



Pool table room at 23.4 seconds

Figure 5.2. Still images from the Polaroid camera flashes.

However, the experiment data challenged the use of repetitive flashes of light to create suspense. The majority of viewer mediation peak responses that occurred after 16.0 seconds reduced in terms of their anxiety durability and intensity level. Even when the antagonist (a man) appears on screen walking fast towards the camera to attack Sarah at 34.1 seconds, it only produced one mediation peak response. This demonstrates that a moving image revealing the identity of antagonist attacking Sarah at the end of the film clip did not elicit a stronger form of anxiety than the Polaroid camera flashes of light or the first dark shot especially during 4.7-16.0 seconds. One of the main problems with suspense being constructed using a pattern of bright flashes of light and dark shots is that, for some viewers, suspense was diminished because they quickly became habituated to the way suspense is being constructed. For example, viewer 7 (female), who reacted with an 'Extended Fear' level 1 response on 14.0 seconds during the first dark shot and a 'Momentary Fear' level 3 response on 21.8 seconds after the second bright flash of light explains:

> It was pitch black and so you had no idea what was going on. You learn pretty quickly that it's probably done… photograph flashes. And there's a few normal photograph flashes just to get you used to the idea of what it is…(viewer 7).

Viewer 7's mediation peaks demonstrate the difference in her anxiety responses during the first dark shot and most suspenseful segment of the film clip during 4.7-16.0 seconds and the third bright flashes of light on 21.8 seconds. Her comments also confirm why viewers' strong anxiety responses during dark shot 1 declined during the dark shots 2, 3, and 4, when she talks about the repetitive pattern of the bright flashes of light, photograph and dark shots becoming familiar.

Although *Silent House* direct suspense initially generated a powerful form of suspense during 4.7-16.0 seconds, the repetitive pattern of light and dark, light and dark are not shown in the same frame, and Sarah's identity is not being revealed. The lack of visual story elements on screen produced a decline in viewer anxiety durability and intensity level after 16.0 seconds. One reason why the antagonist's attack on Sarah did not elicit a strong anxiety response is because the appearance of the antagonist and the attack only lasted for 0.44 seconds and that only one mediation peak response was recorded. Analysis of other film clips in the experiment also reveal key elements that the *Silent House* clip lacks, for instance in relation to the framing of the protagonist and antagonist. This will be demonstrated in the next case study by returning to the *Quarantine* vicarious suspense discussed in the previous chapter. In this analysis, however, I will explore how light and darkness within the same frame successfully elicits a sustained powerful form of suspense.

Case Study 2 - *Quarantine* vicarious suspense

The *Quarantine* clip involves a protagonist called Angela and her colleague, Scott, a cameraman, who neither heard from nor visible to the viewer during the film clip. Angela and Scott are both trapped in a dark room in an apartment with a zombie who is unaware of their existence. The viewer has Scott's point-of-view through his hand-held camera with the night-vision switched on, so he can see anything dangerous that is hidden in the dark behind Angela. The camera is focussed on Angela's face, upper body and the dark space behind her during the film clip. The discussion will analyse the night-vision as a light source, which in real life can only be accessed when someone looks through the camera lens. This is because night-vision is not an external light source, instead it creates phosphorous green and black images within the camera

lens. So the viewer has Scott's point-of-view through the hand-held camera during the whole film clip so that viewers see objects and fictional characters on screen in shades of green.

Quarantine was consistent in producing a sustained powerful anxiety response indicated by 4 clusters of 'Extended Fear' level 1 responses during four short film sequences 0.0-5.0, 11.0-13.0, 20.0-22.0 and 35.4-39.4 seconds during the 40.0 second film clip. *Quarantine* successfully constructs suspense by combining night-vision phosphorous green lighting from a hand-held camera and complete darkness in the same frame. The discussion will analyse how the night-vision green lighting reveals and darkness conceals story information to the viewer during the four short film sequences. When combined, these four film sequences produced a prolonged anxiety response at the highest level of intensity, indicated by 68.4% of total viewers, reacting with 'Extended Fear' level 1 responses.

Film Sequence 1: 0.0-5.0 seconds

Sequence 1 starts at the beginning of the film clip with the night-vision green lighting of high intensity hard light being focussed on Angela's face, which is framed in a close up, creating well-defined dark shadows. The green lighting that can only be seen when looking through the camera attempts to construct suspense by appearing to illuminate Angela's face and revealing her facial expressions to the viewer, with the dark background concealing other visual story information. The green lighting draws the viewers' attention to Angela's facial expressions and body movements (Figure 5.3), whereas the darkness conceals story information and cues the viewer that something might be hidden in the dark that could threaten Angela's life. The green lighting of high intensity, hard light produces a mono colour tone in an attempt to create an eerie aspect of Angela's facial expressions, rather than if her face was illuminated by natural light which would reveal her natural skin of multi-flesh colour tones.



Figure 5.3. At 1.5 seconds Angela's face is shown in extreme close up and allowing viewers to access her facial expressions.

This combination of green lighting of high intensity, hard light and darkness emphasises the close ups of Angela's face, enabling the viewer to gain a deep insight into what she is feeling through her facial expressions (Kydd 2011:120). When the camera directs the viewers' attention behind Angela, the night-vision green lighting reflects off a metal trolley in the background (Figure 5.4). This attempts to construct suspense by playing on the viewer's imagination of what might appear next to the metal trolley and whether something could attack Angela at any moment. Overall, the low-key lighting in this sequence constructs suspense with the night-vision green lighting revealing Angela's facial expressions and body movements and the strong contrast between the bright green lighting and dark background in the same frame revealing Angela' vulnerability to an attack from an unknown antagonist.



Figure 5.4. At 4.2 seconds viewer 24 elicited an 'Extended Fear' level 1 response.

The first film sequence elicited 27.7% of total 'Extended Fear' level 1 responses for the film clip, indicating that these viewers experience a prolonged anxiety response at the highest levels of intensity. Turning to viewer comments, the majority did not explicitly mention the green coloured lighting, instead they implied it by mentioning 'night-vision'. For example, viewer 12 (male), who reacted with an 'Extended Fear' level 4 response, explains: 'The lights were off, so that would explain the greenish glow to everything, as she was recording through night vision.' When considering viewer comments concerning the construction of suspense using night-vision lighting and darkness, 52.6% referred to night-vision compared to 47.4% of viewers who mentioned darkness. These comments indicate that the strong colour contrast between the green lighting (revealing story information) and darkness (concealing story information) created a 'really high suspense scene, just the fact that there's no light in the room and you're seeing everything from a night vision lens' (viewer 2). Viewer 24 (male), a multi-mediation peak responder who reacted with an 'Extended Fear' level 1 response at 4.2 seconds, explains: 'This kind of clips, where they show scenes using night images, night-vision cameras are usually very suspense'. Viewer 24's comments imply that the night-vision green lighting elicited suspense, which is also supported by his mediation peak responses during this film sequence. Many viewers also made the connection between night-vision lighting and being suspenseful and frightening as will be explained later.

Film Sequence 2: 11.0-13.0 seconds

The second sequence attempts to construct suspense through a combination of high intensity of hard green light revealing Angela's anxieties through her facial expressions (Figure 5.5), with a low intensity of soft green light revealing where a possible threat to Angela's life may occur, by the metal trolley. This informs us that the high intensity of hard green light makes the viewer aware that Angela is frightened because they can see her facial expressions of fear. In contrast, the soft green lighting with low intensity reveals the metal trolley behind her in more detail than in sequence 1, which cues the viewer to anticipate that something could be lurking in the dark behind her. This 2.0 second-long film sequence produced 16.6% of total 'Extended

Fear' level 1 responses from the film clip, indicating these viewers experienced a prolonged anxiety response at the highest level of intensity.



Figure 5.5. At 12.0 seconds viewer 20 elicited an 'Extended Fear' level 1 response.

When turning to viewer comments, viewers' anxieties were driven by them knowing Angela cannot see in the dark, combined with the night-vision lighting. For example, viewer 20 (male), a multi-mediation peak responder who reacted with an 'Extended Fear' level 1 response on 12.0 seconds, said: 'The fact that she could not actually see what was happening, but she could only hear it... and the night vision camera really makes it'. For viewer 20, his mediation peak response and comments inform us that the construction of suspense was created by story information not being revealed to Angela, which impedes her chances of survival, because she cannot see what is happening around her and is defenceless to an attack from an unknown antagonist. This is supported by this 2.0 second film sequence eliciting 16.6% of total 'Extended Fear' level 1 responses from the film clip, indicating these viewers experienced a prolonged anxiety response at the highest level of intensity. The construction of suspense during this short film sequence concerns the camera focusing on what is behind Angela, the metal trolley and dark space where a possible threat may appear combined with Angela looking frightened about the prospect of being attacked by an unknown antagonist.

Film Sequence 3: 20.0-22.0 seconds

The third film sequence in the clip attempts to construct suspense using the high intensity of hard green light to reveal Angela's emotional state and simultaneously a soft green light with low intensity revealing a blurred image of the antagonist (zombie) behind her. This indicates that darkness has been used to conceal and delay the identity of the antagonist from the viewer. The night-vision lighting also draws the viewers' attention to Angela's facial expressions of fear and the blurred green human figure behind her that looks like a zombie. Moreover, the zombie is briefly shown holding a hammer in his hand and he then disappears into the dark behind Angela (Figure 5.6). Therefore, this short film sequence attempts to construct suspense by revealing story information to the viewer using two types of green lighting and levels of intensity. This short film sequence elicited 16.6% of total 'Extended Fear' level 1 responses from the film clip, indicating these viewers experience a prolonged anxiety response at the highest level of intensity.



Figure 5.6. At 21.7 seconds viewer 17 reacted with an 'Extended Fear' level 1 response.

Turning to viewer comments to contextualise their experience, no viewer made any comments referring to the zombie holding a hammer until the fourth film sequence, which will be expanded upon later. Based on viewer comments, the soft green lighting with low intensity constructed suspense by revealing an 'ambiguous' human figure (zombie) in the background that looked to be a serious threat to Angela's life. For example, viewer 27 (male), who reacted with an 'Extended Fear' level 1 response, explains how the green soft lighting concealed the full identity of the zombie in the background and how this made him feel scared. He said: 'The not very clear outlines in the background made it hard to tell if it was just objects in the room or someone moving around, which made it kind of scary.' This indicates that the soft green lighting with low intensity increased viewers' anxieties, because it created ambiguity about the zombie's full identity, rather than the brief moment that reveals an explicit threat to Angela's life with the zombie holding the hammer in his hand.

Film Sequence 4: 35.4-39.4 seconds

The final film sequence from this clip attempts to construct suspense using night-vision green lighting in three ways. First, the viewer watches the film sequence with a high intensity of hard light and close up of the Angela's face showing her facial expressions of terror (Figure 5.7).



Figure 5.7. At 35.2 seconds viewer 5 elicited an 'Extended Fear' level 1 response.

Secondly, when frightened, Angela and the zombie are shown in high intensity of hard green light, which gives the impression they are very close to each other. This threat to her life is compounded with the zombie appearing behind Angela and walking towards her holding a hammer in his hand (Figure 5.8). Thirdly, the high intensity of hard green light only reveals the zombie's legs and lower torso of the body with the zombie's face concealed from the viewer by a dark shadow and camera frame (Figure 5.9), making the zombie appear powerful and threatening (Brown 2012: 65).



Figure 5.8. At 35.7 seconds viewer 7 reacted with an 'Extended Fear' level 1 response.



Figure 5.9. At 38.5 seconds viewer 14 reacting with an 'Extended Fear' level 1 response.

This sequence produced 27.7% of total 'Extended Fear' level 1 responses from the film clip, indicating these viewers experience a prolonged form of anxiety at the highest level of intensity. When we turn to viewer comments about story information that specifically occurred during the fourth film sequence, viewers described the threat of the zombie appearing behind Angela and walking towards her with a hammer in his hand. As Viewer 22 (male), a multi-mediation peak responder, reacted with an 'Extended Fear' level 1 response on 31.9 seconds, explains:

> And then later on as he moved closer I could see it's a monster, I would say. And it was getting closer to her, and I was not sure whether she was going to hit her with the hammer or was she going to just walk past her. And it felt very scary (viewer 22)

Viewer 22's comments inform us that the night-vision light intensity levels played an important role in revealing the threat of the zombie holding a hammer and moving closer to Angela. When we combine the high intensity of hard green light with high intensity continuously revealing Angela's facial expressions of fear and terror, it is not surprising that many viewers experienced a prolonged anxiety response at the highest level. Viewer 16 (male), a multi-mediation peak responder, reacted with an 'Extended Fear' level 1 response during the film clip and said: 'The last part gave me a real fright, when that weird thing appeared and the emotion that the girl expressed' The comments from viewers 16 and 22 inform us that the night-vision green lighting and high level of light intensity construct a powerful form of suspense by revealing Angela's emotional state and the zombie's threat within the same frame.

Based on the 4 clusters of 'Extended Fear' level 1 responses during the 4 film sequences and viewer comments, the *Quarantine* vicarious suspense clip was successful in eliciting a prolonged form of anxiety at the highest level of intensity by concealing and revealing story information through night-vision lighting at different levels of intensity and darkness within the same frame. We can break down the key reasons why these viewers experienced a powerful form of suspense. First, Angela's facial expressions were consistently being revealed during the four film sequences, mainly through a high intensity of hard green lighting. This enabled viewers to understand her emotional state, in particular how she was becoming more terrified as

the film clip progressed. Secondly, the high lighting intensity also revealed the zombie's threat - holding a hammer and walking closer towards Angela within the same frame. Thirdly, the soft green lighting with low intensity constructed a power form of suspense by revealing the zombie as an ambiguous human figure and delaying the revelation of the zombie's full identity and threat.

This informs us that the night-vision camera was an important factor in constructing a powerful form of suspense in *Quarantine*, which integrates cinematography with an artificial light source within the camera lens. Importantly the use of night-vision lighting in *Quarantine* elicited a strong form of suspense by revealing Angela's emotional state through her facial expressions of fear combined with darkness in the same frame, concealing and delaying information about the zombie. The darkness also intensified viewers' anxiety responses because Angela could not see the zombie and that the zombie could not see or knew of Angela's presence. The darkness then in this cases assists in the construction of vicarious suspense, where viewers are privileged with narrative information that fictional characters are denied. The *Silent House* direct suspense film clip demonstrates that when light and darkness are not shown in the same frame diminishes suspense. In *Silent House* this decline in suspense was also associated with darkness accounting for 86.6% of the film clips duration, making it difficult for viewers to know what was happening in the story world and having to work harder mentally to understand the story context through aural elements.

Sound in Horror Films

According to Peter Hutchings, sound plays a more significant role in horror films than other genres, from the stinger that produces sudden scare moments to make the viewer jump from their seat, to music scores that emphasise characterisation and to dramatize action sequences and body movements (Hutchings, 2004). Hutchings particularly refers to the importance of off-screen sounds, where the visible source cannot be seen on screen, which are often used as an aural signature of an antagonist's presence (Hutchings, 2004: 141). An example of this occurs in the film *The Strangers* (Brian Bertino, 2008), which was used in the film experiment. A loud unexpected ominous knock at the front door startles Kristen McKay (Liv Tyler) at 19:02:23 (minutes:

seconds: frames) into the film. As Kristen walks cautiously towards the front door, the loud knock is repeated at 19:25:10. This off-screen diegetic sound conceals its visual source from Kirsten and the viewer, at first possibly making the viewer jump but on repetition prompts the viewer to make assumptions that whoever is knocking on the door is the antagonist with the viewer fearful of Kirsten's safety.

Although film scholars describe a diegetic sound with no visible source on screen as an 'off-screen' sound, this term has been challenged for its inaccurate description, as Christen Metz explains:

> We tend to forget that sound itself [is] never "off": either it is audible or it doesn't exist. When it exists, it could not possibly be situated within the interior of the rectangle or outside it, since the nature of sounds is to diffuse themselves more or less into the entire surround space (Metz, 1985: 157).

Many film theorists have replaced the term 'off-screen sound' with 'acousmatic sound' because the meaning of the word 'acousmatic' is a sound without its visual source (Kydd, 2011: 169; Fenimore, 2010: 80). The word 'acousmatic' will be used as the term to describe off-screen sounds in the sound analysis of the case studies. The fact that acousmatic sounds do not have a visual source on screen enables them to be an effective cinematic component to conceal, delay or reveal narrative information, in particular the presence of the antagonist and/or the type of threat they pose to other fictional characters.

We shall now turn to the music score of a film, which is not part of the story world and cannot be heard by fictional characters. According to Janet Halford, the musical score is composed to aurally describe the scene or film's identity, which can be 'achieved through the manipulation of musical elements including melody, tonality, tempo, rhythm, instrumentation, musical texture, and potentially any other aspects of the composition' (Halfyard, 2010: 21). With such an array of musical elements available to the composer and sound designer, music and sounds can be digitally manipulated to create a desired effect and viewer response. For example, horror films create specific musical cues, such as a sustained deep sonic drone which is perceived

by the viewer as a sound that creates a threatening atmosphere, tension and suspense (Halfyard, 2010: 21-22).

In contrast, the musical 'stinger', which is a short, loud and discordant noise, is experienced by the viewer as a direct attack on them, producing a 'scare moment' that shocks the viewer and makes them jump from their seat (Halfyard, 2010: 21-22). The stinger attempts to magnify the threat of the antagonist's presence, their appearance on screen or to underscore something visually frightening on screen. However, a musical score that can be also effective in producing a strong fear response is the Leitmoitf, which presents a direct threat to the viewer through a repetition pattern that is associated with the antagonist and the threat they pose to other fictional characters (Link 2009). For example, John William's music score that represents a killing machine in the form of a shark in *Jaws* (Steven Spielberg, 1975) (Link, 2009: 181-193).

Essentially, music and sound in horror films rely on dissonance and atonality to disrupt musical notes and rhythm of sounds, creating a discordant sound, which makes the viewer feel uneasy and tense (Hutchings, 2004: 146-147). For instance, the tritone disrupts the Western musical system with three intervals between two notes, creating a discordant sound. The tritone is regarded as the devil in the music after it was named the diabolus in musica by medieval musicians and is widely used in horror films to represent something sinister and evil (Halfyard, 2010: 22-23). In addition, according to Peter Hutchings, since the mid 1970's a new form of music emerged in horror films, such as in *The Omen* (Richard Donner, 1976), where choral music depicts the heavenly or evil. Hutchings suggests that these musical scores have become a genre convention of the supernatural thriller (Hutchings, 2004: 144-145). The gradual association between specific kinds of music and sound and particular emotions around fear and suspense therefore form a foundation for the use of both within horror films. Sounds in horror films elicit suspense by scaring the viewer, either by the sound representing the presence of the antagonist through the musical stinger and acousmatic sounds or as a direct threat to the viewer. We shall now turn to the physical and perceptual characteristics of sound.

Sounds Physical and Perceptual Characteristics

Sound is defined by its physical characteristics, which are amplitude, frequency and texture. Amplitude and frequency refer to the sound's waveform structure and texture to the quantity and type of sound waves (Barsam, 2007: 278-280). According to Richard Barsam, amplitude refers to the perception of the sound's ranges of loudness in a film. Film makers tend to keep sound at a medium level of loudness, which is punctuated with silence and extreme loudness to alert the viewer to something important (Barsam, 2007: 278-280). In horror films extremes of silence and loudness are very popular, because they are used to generate sudden scare moments. This can be illustrated in the film *Sinister* (Derrickson, 2012), with the protagonist Ellison walking along a dark corridor in his house. The background music score fades into silence, then seconds later viewers hear a sudden loud thump, creating a scare moment to make the viewer jump. The analysis of the sounds' amplitudes in the case studies will be given a rating of loudness: low, medium, high and very high based on their approximate decibel range.

According to Richard Barsam, the frequency of a sound is perceived as pitch or level, which is described as being high or low. A high pitch sound will have a higher quantity of sound waves per second, while a low pitch sound has a low quantity of sound waves per second. Similar to how a sound's amplitude can be used to create a scare moment in horror film, the sound's pitch is also used in extreme ways. For instance, in the film *Quarantine* the protagonist Angela, is in a dark room and can hear the antagonist (off-screen) behind her making a sudden metal crashing sound, which has very high loudness and a low pitch. The loudness of the sound and low pitch makes Angela anxious and attempts to make the viewer jump from their seat. Turning to the texture of sound waves, this can be referred to as timbre or quality, and it enables listeners to perceive the difference between sounds that have the same amplitude and frequency. However, owing to the fact that timbre is open to interpretation and has no single formal technical definition (Jisc Digital Media, 2015), the analysis of sound in this chapter will focus on amplitude's loudness level and frequency in terms of low, medium and high pitch. Where applicable pitch will also be discussed as an upshift in pitch levels, to illustrate how changes in pitch can increase viewer anxiety responses.

Therefore the analysis of sound in horror films will include the musical stinger and other non-diegetic sounds such as the music score where applicable. Acousmatic sounds that represent the presence of the antagonist and/or acting as a direct threat to the viewer. The physical and perceptual characteristics of sound will be used in terms of level of loudness, low, medium, high and very high and level of pitch, low, medium and high. The sounds in horror films will be analysed using the following two film clips from the film experiment: *Sinister* composite suspense and *Silent House* direct suspense which was discussed in the previous section concerning light and darkness. The *Sinister* composite film clip provides an example of how a repetitive non-diegetic and diegetic sound elicits a stronger form of suspense compared to the *Silent House* direct suspense film clip where the viewer relies on aural elements to understand the story context of the film clip.

Case study 3 - *Sinister* composite suspense

A 45.0 second story sequence has been extracted from the 68.4 second film clip for analysis. The film sequence shows the protagonist (Ellison) walking along a dark corridor in his house as he hears the sound of a film projector mechanism and voices chanting, which seem to be coming from the loft in the house. Ellison continues to walk in the direction of both sounds and climbs the loft ladder before looking inside the loft entrance to see who is creating the sounds. *Sinister* has been selected as a case study because it demonstrates how the acousmatic sound of demonic chanting combined with character dialogue and a non-diegetic deep sonic drone was successful in constructing suspense by concealing and revealing story information to the viewer, especially when compared to the acousmatic sound of a film projector mechanism that alone attempts to create a stronger aural threatening presence of the antagonist. The discussion will analyse four aural sequences (A, B, C and D) from the 45.0 second segment (Figure 5.10). The discussion will begin with an analysis of the sound of a film projector mechanism (sound 3), the most dominant sound in terms of loudness and pitch that occurred during aural sequence A (7.0-9.0 seconds) and D (39.0-45.0 seconds). This will be followed by an analysis of sounds 1, 2 and 4 which were

synchronised together and sound 1 being played in isolation during aural sequence B and C.

Order of the sounds	Sound description	Sequence	Loudness	Pitch
1	Deep sonic drone with intermittent pulsing beat	B and C	Low - Medium	low
2	Distorted voices singing demonic chanting	B and C	Medium-Loud	Low
3	Film projector mechanism	A and D	High – Very High	Low
4	Protagonist dialogue (Ellison) 'What is happening'	B	Low	Medium

Figure 5.10. Table 3 - The sounds that reveal and conceal story information and are grouped in the following aural sequences A, B, C and D.

Aural Sequence A: Film Projector Mechanism (7.0-9.0 seconds)

Sound 3 is a Super 8mm film projector mechanism. The sound is an acousmatic rapid metallic drone that has a high level of loudness and low pitch making the sound aggressive and threatening. Drones can be diegetic or non-diegetic sounds and are commonly used in horror films to produce a threatening ambient atmosphere, act as a direct threat towards the protagonist or represent the aural presence of the antagonist. The film projector mechanism punctuates sounds 1 and 2 and is the dominant sound during 7.0-9.0 seconds. With sound 3 having a high level of loudness, the sound should be perceived by viewers as being very close to them, making it more threatening (Donnelly, J. 2010: 162), even though its visible source is not shown on screen. The film projector mechanism sound attempts to construct suspense first by revealing the

antagonist's presence. Secondly, the rapid aggressive rhythm, high level of loudness and low pitch creates a perceived direct threat towards the viewer because it is a very loud discordant sound making it appear more threatening and close to the viewer (Donnelly, J. 2010: 162). Thirdly, it provides an example of where the filmmaker uses an acousmatic sound to represent the threat of the antagonist's presence. In this instance the viewer and protagonist hear a loud discordant unexpected sound of the film projector, 'a sound that denotes the unseen presence of something that should not be there' (Hutchings, 2004: 129). Fourthly, the acousmatic sound also represents a threat to Ellison's life.

The Super 8mm film projector mechanism sound is repeated in sequence D during 39.0-45.0 seconds, with the loudness level increasing from high to a very high, creating a very discordant sound. The increased loudness attempts to produce a more sustained and serious threat to Ellison's life than when first played at a high level of loudness during aural sequence A. When combining aural sequences A and D, the film projector mechanism produced 10% of total 'Extended Fear' level 1 responses, even though it was the most aggressive and loudest sound during the film clip. Moreover, during sequence D, the frequency of viewer mediation peak responses started to decline. Although this discordant acousmatic sound was designed to be very threatening, only 5% of viewers mentioned the film projector mechanism sound in their comments, with one viewer suggesting it was annoying.

For example, viewer 1 (female) a multi mediation peak responder, reacted with an 'Extended Fear' level 1 during aural sequence C, the most suspenseful aural sequence of the film segment. She implied that the film projector mechanism sound was irritating: 'OK, the first thing you notice is the noise. It's not even music, it's just noise' Viewer 1's comments also imply that she heard the noise at the beginning of the film clip, confirming she was commenting about the film projector mechanism sound, which was the most dominant sound when played during 7.0-9.0 seconds. Moreover, although sounds 1 and 2 were playing at the same time, the viewer could not have heard them because the film projector sound was so aggressive and loud it

drowned them out. When taking into consideration mediation peak responses and viewer comments, the film projector mechanism sound was not perceived by viewers as a direct threat towards them or Ellison and was therefore not successful at representing the aural presence of the antagonist or sound that would scare them. Furthermore, the film projector mechanism was not mentioned by viewers in regard to it being frightening, even during its loudest and longest sequence of 39.0-45.0 seconds.

Aural Sequence B and C

Aural sequences B (11.0-13.0 seconds) and C (30.0-35.0 seconds) elicited a powerful anxiety response in viewers and were causally linked together with sequence B assisting sequence C to elicit the most suspenseful aural sequence during the 45.0 second film segment. These two film sequences combined produced 64.3% of total 'Extended and Momentary Fear' level 1 responses from the film segment, which indicates these viewers experienced either a prolonged or condensed anxiety response at the highest level of intensity. The discussion will first analyse sounds 1, 2 and 4 during aural sequence B followed by sounds 1 and 2 during aural sequence C, demonstrating how they were successful in constructing a sustained powerful form of suspense through revealing, delaying and concealing story information to Ellison and the viewer.

Aural Sequence B: 11.0-13.0 seconds

Sound 1 is a non-diegetic music score (0.0-39.0 seconds) that is a deep sonic drone with an intermittent pulsing beat with low-to-medium levels of loudness and low pitch. This deep sonic drone constructs suspense by creating an ominous and threatening atmosphere. When played in isolation during 12.0-13.0 seconds, sound 1 invites viewers to ask questions about what they are hearing and what the sound will reveal to them about the story world and a potential threat to Ellison's life. Sound 2 is an acousmatic sound that comprises distorted voices singing a demonic chant that has a medium-loud level of loudness and a low pitch that is synchronised with sound 1 during 10.0-11.0 seconds. The distorted voices are created by overlapping the sound of the voices.

According to Peter Hutchings, voices singing a demonic chant act in horror films as warning of a threat to the protagonist and cues the viewer about an off-screen supernatural threat.

> Most notable here was Jerry Goldsmith's Oscar-winning score for The Omen (1976) which featured a chorus of male and female voices singing, in an appropriately portentous Gregorian-chant style, such as Latin phrases as 'Ave versus cristus, Ave santani' (translated: hail the Antichrist, Hail Satan). As with Goblin's score for Suspira, the music here represented a villain who remained firmly off-screen, namely Satan himself (Hutchings, 2004: 144-145).

Hutchings informs us that viewers who watch supernatural horror films will be familiar with the style of chanting that relates to a supernatural theme and threat. With the viewers who took part in the film experiment being used to watching horror films, hearing the distorted voices singing a demonic chant constructs suspense by recalling their memories of hearing similar sounds in other supernatural horror films. This then enables viewers to make assumptions about a supernatural force and sets viewer expectations of what the demonic chanting will reveal to them in the form of an antagonist and threat to Ellison's life.

The overlapping (distortion) of the voices is also used in an attempt to make the demonic chanting more ominous to Ellison and the viewer. With the distorted voices singing a demonic chant synchronised with sound 1 at 0.0 seconds, sound 1 attempts to underscore the more threatening sound of distorted voices singing a demonic chant. When considering viewer feedback comments regarding sound 1 and sound 2, which were the longest aural sequences during the whole film clip, 30% of viewers who said the 'music was scary' also said that the demonic chanting was 'creepy'. Although sounds 1 and 2 worked together to create a chilling threatening tone, based on viewer comments the distorted voices singing a demonic chant was the most dominant and threatening of the two sounds. Moreover the distorted voices singing a demonic chant constructed suspense by concealing the identity of the character(s) performing the chant and also represents another aural strand of the antagonist's presence that threatens Ellison's life. This sequence between 1.0-6.0 seconds elicited 20%

‘Extended Fear’ level 1 responses indicating that these viewers experiences a prolonged anxiety response before they hear the film projector mechanism sound that occurred 7.0-9.0 seconds (sequence A).

At 10.0-11.0 seconds (sound 4), Ellison speaks quietly and nervously, the phrase ‘What is happening?’ creating a third layer of sound, synchronised with sounds 1 and 2 in an attempt to heighten suspense during 11.0-13.0 seconds. This short phrase spoken by Ellison reveals to the viewer that he can hear the acousmatic sound of the distorted voices singing a demonic chant. Also, the viewer can see Ellison’s anxious reaction to the demonic chant as he carries on walking in the direction of the voices. Turning to viewer mediation peak responses, this short aural sequence elicited a cluster of 28.5% of total ‘Extended and Momentary Fear’ level 1 responses from the 45.0 second film segment. This indicates that these viewers experienced a prolonged or condensed anxiety response at the highest level of intensity. Based on these findings, Ellison’s three words of ‘What is happening?’ underscores the threatening sound of the demonic chanting, as he stands still looking in the direction of where the sound is coming from. Ellison then walks in the direction of where the voices appear to be coming from, in the loft of the house, thereby increasing viewer anxieties. Some viewers referred to the demonic chanting coming from the loft in their comments.

For instance, viewer 11 (male) who reacted with a ‘Momentary Fear’ level 1 response at 32.7 seconds, explains: ‘…the weird, almost hymn-like satanic noise coming from above. And then you weren’t really sure what to expect in the attic.’ Viewer 11’s comments imply that he made an assumption early on during the film segment that the demonic chanting sound was coming from the loft. Furthermore viewers associated the demonic chanting sound coming from the loft with an unknown antagonist because they did not want Ellison to access the loft as viewer 22 explains ‘…it felt really creepy as he was approaching the steps, in the dark. And the music was very creepy as well. I didn’t want him to go upstairs…’ This then, supports the idea that the demonic chanting synchronised with Ellison’s words ‘What is happening?’ and sound 1 cued the viewer that Ellison was aware that the supernatural threat was coming from the loft. What is interesting is that the cluster of ‘Extended and Momentary Fear’ level 1

responses continues during a two seconds sequence (12.0-13.0 seconds) of the film clip. This is when the deep sonic sustained drone (sound 1) was playing in isolation, indicating that the subtle quieter tone of sound 1 also played an important role in sustaining a high level of anxiety intensity, with viewers waiting in anticipation to see what happens next.

Aural Sequence C: 30.0-35.0 seconds

According to viewer mediation peak responses, aural sequence C produced the most sustained high level anxiety response during the film segment. This aural sequence elicited 35.7% of total 'Extended and Momentary Fear' level 1 responses and 33.3% of total 'Extended and Momentary Fear' level 2 responses from the film segment. During this sequence these viewers experienced the peak of suspense, which begins with sound 1, the deep sonic drone playing in isolation during 30.0-32.0 seconds. When the deep sonic drone is synchronised with the distorted voices singing a demonic chant during 32.0-35.0 seconds, suspense is maximised and sustained at the highest level of anxiety intensity.

When considering viewer comments regarding the different sounds, viewer 16 (male), a multi-mediation peak responder reacting with a 'Momentary Fear' level 1 response, said: 'The background music and the chant made me really nervous and scared at the same time'. In this instance, viewer 16 describes the deep sonic drone synchronised with the demonic chanting as forming a very ominous sound. Another multi-mediation peak responder, Viewer 17 (female), who reacted with an 'Extended Fear' level 1 response at 33.0 seconds, also explains how the music was quite frightening and that the sounds were building up to something that would threaten Ellison's life. She said: 'The music. The music stood out the most, because you knew something was happening, something was building to something, and I'm thinking don't go up the stairs'. Viewer 17's comments also imply the following key factors that constructed suspense: firstly, the music (sounds 1 and 2) revealed to her that something frightening was in the loft that would attack Ellison. This is supported by the generic conventions of the supernatural thriller, where demonic voices and chanting are an established aural element, acting as a threat to the protagonist and viewer (Hutchings, 2004: 144-145).

Secondly, with the distorted voices singing a demonic chant coming from the loft indicates why viewer 17 experiences a strong anxiety response when Ellison starts to climb the loft ladder. Furthermore we can tell it was at this point viewer 17 felt such a strong anxiety response because she reacted with an 'Extended Fear' level 1 response as he climbs the loft ladder. Thirdly, The sonic drone (sound 1) was very effective in sustaining a strong anxiety responses in viewers towards the end of sequence B and at the beginning of sequence C. Sounds 1 and 2 in aural sequences B and C also demonstrate how a repetitive pattern of concealing and revealing story information can elicit a powerful anxiety response, heightening and sustaining suspense.

Based on viewer mediation peak responses and viewer comments, sounds 1, 2 and 4 were successful at eliciting a sustained powerful form of suspense. The demonic chanting (sound 2) revealed the threat of the antagonist, yet concealed its identity, secondly, and so acted as an aural strand of the antagonist's threatening presence. To elaborate further, when a diegetic sound resonates with the viewers as a recognisable threat to the protagonist or themselves the viewer, it not only elicits a strong anxiety response but does so very quickly. This is because the demonic chanting/voices is an established convention in the supernatural thriller and viewers who watch supernatural thrillers will immediately recognise this type of sound as threatening (Hutchings, 2004: 144-145). With the demonic chanting sound representing an unknown antagonist also constructs suspense because it reveals to the viewer that the antagonist is nearby, who could suddenly appear on screen and scare them. At the same time the antagonist's identity is not fully revealed which invites the viewer to imagine what and who they are, which increases viewer's anxieties (Norden, 1980: 72-73). Suspense was also created through Ellison's words (sound 4) which cued the viewer that the demonic chanting was coming from the loft and that he was anxious about the demonic chanting.

Case Study 4 - *Silent House* direct suspense

The previous section discussing lighting in the *Silent House* direct suspense clip was used to demonstrate how a Polaroid camera flash of light and total darkness used a repetitive pattern of revealing and concealing information to construct suspense. In

this section the discussion will analyse how sound reveals story information to the viewer when 86.4% of the film clip is in complete darkness and how the viewer has to rely on acousmatic sounds to make sense of the narrative and story world. In particular, dialogue and inanimate objects with a low or medium loudness and a low or high pitch, elicit a stronger form of suspense compared to the 'stinger' that attempts to create a startle response in the viewer.

Table 4 in figure 5.11 lists the different acousmatic sounds, at what time they occurred, their duration, loudness and pitch. The analysis will first focus on the sounds that elicited the most suspenseful sequence (4.7-16.0 seconds) during the film clip which was determined by the presence of 78.8% of total 'Extended Fear' level 1-2 responses from the 37.4 second film clip. This will be followed by the analysis of different startle stimuli, which include: a Polaroid camera shutter mechanism, antagonist's heavy footsteps and the protagonist's (Sarah) piercing screams.

No	Time (seconds)	Most dominant sounds	Loudness	Pitch
1	0.1-2.1	Polaroid camera mechanism 1	Medium - high	Low
2	3.0-10.5	Sarah's whimpering cries	Low	High
3	9.6-14.4	Background sonic drone	Low	Low
4	14.5-15.5	Childs toy rattle	Low	High
2	13.0-16.0	Sarah's whimpering cries	Medium	Medium-High
1	18.0-20.0	Polaroid camera mechanism 2	Medium - high	Low
5	18.2-20.5	Sarah's piercing scream	High	High
1	23.3-25.5	Camera mechanism 3	Medium - high	Low
6	34.0-35.5	Antagonist heavy footsteps	Medium-high	Low
5	34.1-35.5	Sarah's piercing scream	High	High

Figure 5.11. Table 4 - The most dominant sounds in the Silent House direct suspense clip.

Although the most suspenseful aural sequence was during 4.7-16.0 seconds, the analysis will start at the beginning of the film clip when the first sound occurred. The film clip starts with a startle stimulus, produced by a Polaroid camera shutter mechanism (sound 1), which has a duration of 2.0 seconds and has a medium level of

loudness, fast tempo and low pitch. The startle effect from a familiar camera shutter mechanism sound prompts the viewer that visual story information will appear on screen in the form of a still image. In the context of the film clip being from a horror film, viewer expectations are more likely anticipate that the still image will scare them. For example, viewer 17 (female), who reacted with an 'Extended Fear' level 1 response at 14.0 seconds, explains: '…you knew that every time she was going to take a Polaroid something would get closer. I didn't like it, it made me feel uncomfortable.' For viewer 17, the anticipation of waiting for the next Polaroid camera shutter mechanism increased her anxiety because she also anticipated that the image appearing on screen following the camera shutter mechanism sound would be frightening and appear close to her.

Therefore, the sound of the camera shutter mechanism at the beginning of the film clip was likely to encourage viewers to anticipate what will happen next, which was also demonstrated by viewer 'Extended Fear' level 3-4 responses occurring during and after the sound of the camera shutter mechanism had run its 2.0 second cycle. Once the image disappears, leaving a black screen from 1.0-18.4 seconds, viewers rely on a non-diegetic music score (sound 3) and two acousmatic sounds (sounds 2 and 4) to understand the story context of the film clip. During the most suspenseful sequence (4.7-16.0 seconds), the first sound viewers listen to Sarah's whimpering cries (sound 2) with medium level loudness and an intermittent increase in pitch. This sound invites viewers to ask questions about Sarah, such as why she is upset and whether she has been attacked. At 10.5 seconds, the whimpering cries are synchronised by a background sonic drone (sound 3), which has a lower level of loudness and lower pitch. Suddenly the sonic drone is interrupted by Sarah's whimpering cries on 13.0-16.0 seconds, which is synchronised briefly with a child's toy rattle (sound 4) that has a lower level of loudness and high pitch during 14.5-15.5 seconds.

The most dominant sound during the 4.7-16.0 second aural sequence in terms of loudness was Sarah's repetition of her whimpering cries, which had a total duration of 10.5 seconds. This means that viewers also heard Sarah's cries at a higher level of loudness with an upshift in pitch and for a longer time than sounds 3 and 4. According

to scientists Daniel Blumstein, Gregory Bryant and Peter Kaye, when viewers hear human or animal screams or cries with an increase (upshift) in sound pitch, viewers are more likely to experience high arousal.

> We found that subjects reported increased arousal upon hearing upshifts. It is likely that this is because upshifts would naturally be associated with a sudden increase in vocal cord tension; something that might happen when a mammal is suddenly scared. (Blumstein et al. 2012: 4)

According to Blumstein et al's., (2012) theory, viewers are then more likely to experience an increase in anxiety when they hear Sarah's whimpering cries combined with the slight upshift in the pitch, because it is an instinctive response. Based on viewer mediation peak responses, Sarah's whimpering cries, produced 88.8% of total 'Extended Fear' level 1 responses during 3.0-10.5 seconds and from 13.0-16.0 seconds. This demonstrates that these viewers experienced a prolonged form of anxiety at high level of intensity when they heard Sarah's cries, which revealed to them that she was upset and frightened. In addition, as viewers only accessed Sarah's identity through her whimpering cries, since they could not see her, their anxiety increased. Viewer 16 (male), a multi-mediation peak responder who reacted with an 'Extended Fear' level 1 at 5.5 seconds, explained this situation as follows: 'what made me scared was the girl's voice'. Viewer 25 (male), who reacted with a 'Momentary Fear' level 3 response, similarly said that: '…the girl's voice, you can hear her fear, she was crying a little bit'. The comments from viewers 16 and 25 confirm that viewers were more likely to feel scared when they heard Sarah's whimpering cries.

When considering that viewers had to rely on sound to reveal the story context of the film clip, 50% of viewers described the sounds as crucial to understanding what was happening in the film clip. The majority of viewers said that the lack of story information generated high levels of anticipation about what would happen next. For example, viewer 15 (male), a multi-mediation peak responder who reacted with an 'Extended Fear' level 4 response at 4.2 seconds, explained how he had to rely on the different sounds to make sense of the story world and the lack of visual stimulus generated anticipation and suspense:

> The sound-effects gave you a feeling of anticipation and suspense, because at the same time the screen was black, so you basically only relied on the sound-effects to figure out what was going on. The film also created anticipation because you didn't know when you'd be able to see something on the screen (viewer 15)

Viewer 15 describes how sound was important in the construction of suspense. On the one hand, the viewer had to rely on sound to reveal the story context whilst on the other hand, the sounds concealed story information, inviting viewers to make assumptions about what would happen next. Although the wider story context was concealed from the viewer in terms of a visual source on screen, Sarah's whimpering cries was the most successful sound in eliciting a prolonged anxiety response at the highest level of intensity when compared to sounds 1 and 3. We shall now turn to the diegetic sounds, the purpose of which was to shock the viewer.

Startle Sounds 'The Stinger'

Although the first Polaroid camera shutter mechanism triggered the most suspenseful aural sequence during 4.7-16.0 seconds, when the camera shutter mechanism was repeated during 18.0-20.0 seconds (2) and 23.3-25.3 seconds (3) it did not elicit further sustained periods of suspense during the film clip. When considering total mediation peak responses for the repetitive camera shutter mechanism sound sequences, 81.8% were 'Momentary Fear' level 1-4 responses, with the majority being level 3 and 4. Neither camera shutter mechanism sequences triggered a sustained form of suspense like the first camera shutter mechanism sequence. These findings demonstrate that the camera shutter mechanism sound during 18.0-20.0 and 23.3-25.3 seconds was not a successful startle stimulus in generating a prolonged anxiety response at a high level of intensity. One reason why viewers did not experience a fear response to the repetitive sound of the camera shutter mechanism is because some viewers learned quickly that it would be repeated during the film clip, which diminished the startle's affect. This connection between repetition of a startle stimulus and diminishing suspense was mentioned in the lighting section, regarding viewer comments concerning the Polaroid bright camera flash, which occurs at the same time at the camera shutter mechanism sound.

Another startle stimulus that signals the physical presence of the antagonist, appears in the form of a man's rapid heavy footsteps approaching Sarah during 35.6-37.2 seconds. The heavy footsteps have a high level of loudness and low pitch and only elicited one mediation peak response, meaning that it was less successful as a startle stimulus when compared to the Polaroid camera shutter mechanism. Although 45% of viewer comments mention the visual appearance of the antagonist no one mentioned the sound of his heavy footsteps. The final sound startle stimulus was Sarah's piercing screams, which was the loudest sound during the film clip. With Sarah's whimpering cries eliciting a prolonged anxiety response at the highest level of intensity, it could be assumed that Sarah's piercing loud screams should have produced an even stronger fear response. This is because the sound of her piercing loud screams reveals to the viewer that she is more likely being threatened or attacked by someone. Based on viewer mediation peak responses, Sarah's piercing loud screams during 18.2-20.5 and 34.1-35.5 seconds only produced 6% of total 'Momentary Fear' responses from the film clip, with intensity levels 3-4. This informs us that Sarah's repetition of whimpering cries were far more successful in eliciting a prolonged form of anxiety at the highest level compared to her loud piercing screams.

One reason that Sarah's whimpering cries were more successful than her scream is that they are heard for longer (10.5 seconds duration compared to 3.7 seconds duration), indicating Sarah's whimpering had more time to reveal Sarah's emotional state and that she was suffering consistently over time. Although Sarah's brief, sudden, piercing loud screams revealed she could be about to be attacked by someone, these findings indicate that viewers were more likely to experience a prolonged anxiety response at the highest level when the sound Sarah made revealed less information about her emotional state. For example, Sarah's whimpering cries imply she is suffering, but her cries do not reveal to viewers what upsets her or if someone has or will attack her. In contrast, when acousmatic sounds reveal story information through repetition of a startle (camera mechanism or Sarah's screams) sound, the viewer is more likely to make accurate assumptions of the repetitive pattern, which diminishes suspense.

When we consider the construction of suspense through the theme concealing, delaying and revealing story information to the viewer the discussion has demonstrated that there are parallels across lighting and sound. The *Quarantine* vicarious film clip elicited a very strong anxiety response in viewers when night-vision lighting revealed Angela's facial expressions of fear and in the same frame darkness was used to conceal and delay the zombie's appearance to the viewer. Darkness was also used to magnify viewer's anxieties in that the zombie and Angela could not see each other in the dark, even though Angela knew there was a threatening presence close by. With the zombie not being aware of Angela's presence this also increased viewer's anxieties because they anticipated that the zombie would stumble across Angela and attack her. The *Silent House* direct suspense film clip was less effective in sustaining viewer's anxieties because too much narrative information was hidden from the viewer with 86.6% of the film clip in complete darkness. This meant that the viewer had to work harder at understanding the story. Even though the sounds of Sarah's whimpering cries in *Silent House* elicited a stronger anxiety response because of an upshift in pitch, other sounds were less effective. *Silent House* is a good example of where too little narrative information diminished suspense and viewer anxiety responses. The *Sinister* composite film clip though did demonstrate how sound can be used effectively to conceal the physical identity of the antagonist, yet maintain the threat of the antagonist through the demonic distorted voices, an established film convention for the supernatural thriller.

Theme 2 - The Construction of Empathy

One of the key elements how the viewer experiences suspense is through some form of identification with fictional characters (see emotion states of suspense in chapter 1), which is commonly associated with the viewer empathising with a protagonist whose life is being threatened. According to Dolf Zillmann, how empathy occurs in a film depends on the way in which the viewer connects emotionally with fictional characters, as he explains: 'Affective dispositions toward protagonists and antagonists virtually control whether or not empathy occurs - in fact, whether an empathic or counter empathic response occurs' (Zillmann, 1994: 41). With the context being horror films, the protagonist is likely to encounter a serious threat to their life and it is

well documented that when people watch others suffering, especially in pain, they are more likely to experience fear and a high anxiety response (Caes et al. 2012). This is because we are preprogramed to dangers and threats in the world and the pain and suffering they cause (Clasen 2012).

To gain a greater insight into the viewing experience of empathy, the analysis of the film case studies will focus on how elements of cinematography capture a protagonist's facial expressions, because pain is expressed through facial expressions and gestures (Zillmann, 1994: 40-41). Although close ups and extreme close ups of a protagonist in a stressful life-threatening situation can reveal their facial expressions and other body gestures, success in communicating the character's pain is also determined by the actor's performance to create an authentic experience of pain and suffering. Viewers' anxieties concerning the protagonist's predicament will also involve how the protagonist expresses their fear through vocal sounds such as a scream. Viewer empathy for the protagonist also depends on the threat posed by the antagonist (monster), which can be determined by their vocal sound (Hutchings, 2004) and appearance, through facial make-up, costume and computer graphic imagery (CGI special effects). Therefore, this section will analyse case studies that construct empathy in the following sections: cinematography and acting performance, vocalised sounds and mise-en-scène (make-up).

Cinematography (camera shots)

The main focus in this section will be cinematography, in particular, how the close up and extreme close up of the protagonist's face is more successful at accessing the protagonist emotional state compared to other camera shots that do not give the viewer full access the protagonist's facial expressions. Camera shots that will be analysed in the case studies will be as follows: long shot, medium shot, close up, extreme close up. Using cinematographer Blain Brown's visual descriptions of these different camera shots (Brown, 2012: 21), figure 5.12 illustrates the different camera shots using visual examples from *Grave Encounters 2, Pitch Black* and *Quarantine* in the film experiment. The acting performance will also be discussed in terms of the creation of a viewer empathetic connection with a protagonist. Vocalised and inanimate sounds

will also be analysed to demonstrate how they assist in the construction of empathy. Where applicable, mise-en-scène will be used in terms of the protagonist's clothing (blood stains) and head, body movements. Also, the final section of theme 2 will focus on facial make-up of two types of antagonists in the film clip *Sinister* composite suspense.

Image	**Camera shot type**
	Long Shot (*Grave Encounters* 2)
	Medium Shot (*Grave Encounters 2*)

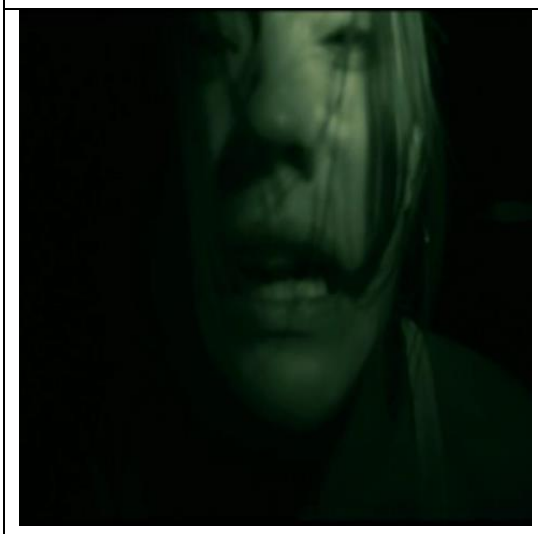
	Close up (*Pitch Black*)
	Extreme close up (*Quarantine*)

Figure 5.12. Camera shots illustrated using still images from film clips used in the film experiment.

Case Study 5 - *Quarantine vicarious* suspense

We return to the *Quarantine* vicarious suspense clip, where the construction of empathy will be analysed using the formal components of cinematography, acting performance and mise-en-scène. Cinematography will analyse a range of close ups and extreme close ups of Angela's face, camera angles and characters positioning within the frame. Jennifer Carpenter's acting performance will also be analysed in terms of how she conveys Angela's emotional state to the viewer. Mise-en-scène will first analyse the blood stained t-shirt worn by Angela and her head and body movements and the body movements of the zombie. (For a description of the film clip please see theme 1 in this chapter or the narrative analysis in chapter 4.) Four of the

most suspenseful film sequences during the film clip have been selected (0.0-5.0, 11.0-13.0, 20.0-22.0 and 35.4-39.4 seconds) for analysis, because they elicited 68.4% of total 'Extended Fear' level 1 responses during the 40.0 second film clip. This indicates that when these viewers watched Angela suffering through close ups and extreme close ups they experienced a prolonged form of anxiety at a high intensity level. The analysis reveals how successful the close ups and extreme close ups of Angela - in isolation and when intermittently juxtaposed with the zombie (antagonist) - were in eliciting an empathetic response for Angela.

Empathy Sequence 1: 0.0-5.0 seconds

The first sequence begins with the viewer watching a close up of Angela's torso and blood stained vest, which attempts to construct empathy by revealing to the viewer that Angela may have previously been attacked and could be injured. With no visible threat, this close up (Figure 5.13) invites viewers to ask questions about Angela's blood stained t-shirt, such as, who attacked her or whose blood is on the t-shirt? Angela then moves her face towards the camera and positions herself so her head and shoulders are seen in close up. She then moves very close to the camera, almost touching the camera lens with her head filling the screen on the right hand side of the frame. Apart from the torso shot at the beginning, 70% of the sequence's duration is devoted to different close ups of Angela's head and shoulders, defined through three types of close up shots (Figure 5.14). These three close up shots in table 6 attempt to construct an empathetic response, because they focus viewers' attention towards Angela's, eyes, nose and mouth and facial expressions.



Figure 5.13. A close up of Angela's blood stained t-shirt shown at the beginning of the film clip which is disguised as dark green patches.



A close up of Angela's face and shoulders with the top of her head cropped



A close up of Angela's nose, mouth and shoulders



A close up of Angela's mouth and shoulders

Figure 5.14. Three different types of close ups of Angela's face occurring between 0.0-5.0 seconds.

The combination of close ups reveal to the viewer that Angela appears shaken rather than in a state of terror. This was implied by viewers stating that at first she looked 'lost' or 'confused'. The first sequence then constructs empathy by giving the impression that Angela may have been attacked or injured and is alone and disoriented by her experience. Sequence 1 produced 27.7% of total 'Extended Fear' level 1 responses, indicating that for these viewers, sequence 1 elicited a prolonged anxiety response with a high level of anxiety. No viewer mentioned her blood stained t-shirt because it was only shown at the beginning of the 40.0 second film sequence and would not have been prominent when viewer gave their feedback comments. This meant that viewers were drawn to Angela's emotions due to the close ups of Angela's face (Figure 5.14), where they could assess what she was feeling.

Turning to viewer mediation peak responses, viewer 14 (female), was a multi-mediation peak responder who reacted with an 'Extended Fear' level 1 response at 4.5 seconds, when she watched a close up of Angela's face showing just her mouth, nose and shoulders (Figure 5.15). Viewer 14 explains how she felt when watching Angela's facial expressions: 'I guess we're not supposed to see what she's actually feeling, but because it's in the film we can. I felt like I was there with her.' Viewer 14's comments strongly imply that she empathised for Angela by stating that she understood what Angela was feeling and felt she was with her.



Figure 5.15. At 4.5 seconds viewer 14 reacts with an 'Extended Fear' level 1 response.

Empathy Sequence 2: 10.0-13.0 seconds

In this sequence, a close up shows a side view of Angela's face looking in the direction towards the left side of the frame. On 10.8 seconds Angela moves her head closer to the camera with the side of her head almost filling the centre of the frame. Although the viewer watches a larger view of Angela's face, the side view shot reduces her facial expressions because the viewer cannot see her eyes or front view of her face, which would reveal more about her feelings and emotional state. Later the viewer has greater visual access to Angela's facial expressions of fear as shown in figure 5.16. Therefore, in this sequence empathy is constructed by drawing the viewers' attention of Angela's anxieties.

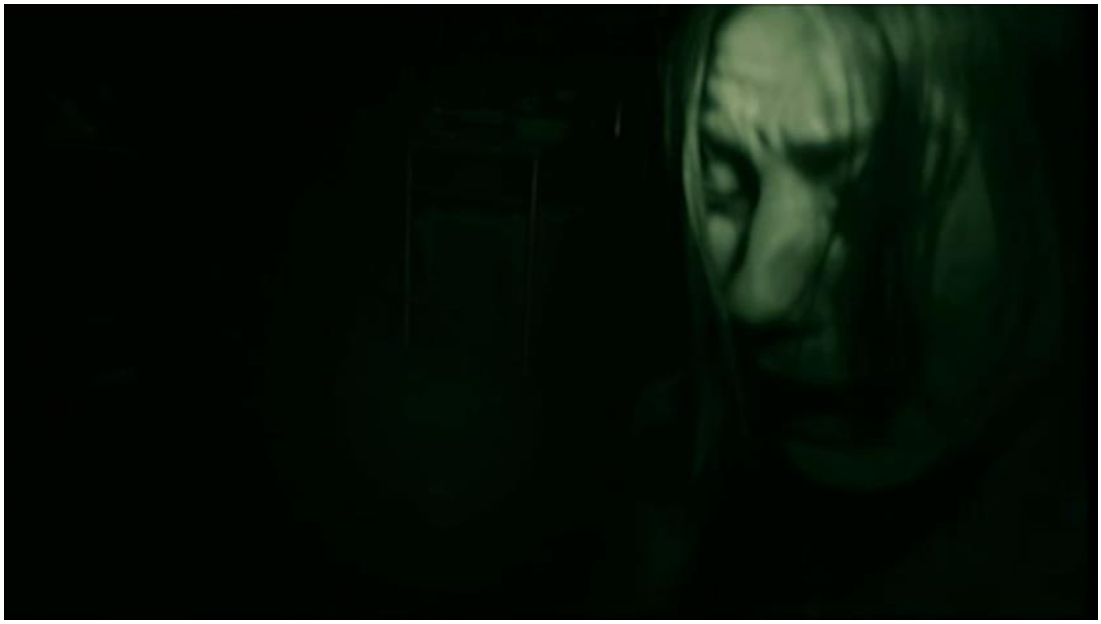


Figure 5.16. At 11.6 seconds viewer 16 reacts with an 'Extended Fear' level 1 response.

This very short sequence produced 16.6% of total 'Extended Fear' level 1 responses from the film clip. Although no viewers made specific comments about Angela looking dishevelled or depressed, the majority of viewers did say that the camera focusing on the actress's (Jennifer Carpenter) facial expressions stood out most. Turning to viewer mediation peak responses, viewer 25 (male) a multi-mediation peak responder, who reacted with an 'Extended Fear' level 1 response said: 'I think the actress, fear on the face was… stood out for me' (viewer 25 my; emphasis). Viewer 25's comments refer to the actress's performance in creating his fear response,

indicating that cinematography is not the only component to eliciting the construction of empathy and that acting performance is very important in communicating a fear response in the viewer.

Empathy Sequence 3: 20.0-22.0 seconds

This sequence begins with a close up shot of Angela's face, with her head positioned on the right side of the frame looking in the direction of the camera. As Angela turns her face towards the viewer showing her facial expressions of fear, a zombie suddenly appears behind her on 21.0 seconds, holding a hammer in his hand and walking towards the right of the frame. The sequence ends with her moving her face closer towards the camera, showing a close up shot of her whole face that shows her facial expressions of fear. This close up of Angela's face is juxtaposed against the zombie in a long shot behind Angela, which attempts to construct empathy through Angela's facial expressions of fear combined with the threat of the zombie appearing behind her. Moreover, the zombie also holding a hammer in his hand also cues the viewer that he poses a serious threat to Angela's life (Figure 5.17).



Figure 5.17. At 21.0 seconds viewer 14 reacts with an 'Extended Fear' level 1 response.

This very short sequence produced 16.6% of total 'Extended Fear' level 1 responses from the film clip. When considering viewer comments many describe the juxtaposition between Angela and the zombie 'wandering in the background' or the zombie being 'behind' Angela. Viewer 7 (female), a multi-mediation peak responder, who reacted with an 'Extended Fear' level 1 response, explains: 'You take your emotion from the woman's face, or I did, I think. I don't know whether she can see what we're seeing but you can see this unknown creature in the background'. Viewer 7's comments imply that she is empathising for Angela because she is concerned about the zombie's threat to Angela's life. This informs us that when a close up shows Angela's facial expressions of fear combined with a serious threat from an unknown antagonist in the same frame, viewers were more likely to empathise with Angela.

Empathy Sequence 4: 35.0-39.0 seconds

This sequence begins with a close up of Angela's face on the right side of the frame, showing her facial expressions of fear with her mouth open. At 35.5 seconds the zombie appears behind Angela with a hammer in his hand and starts walking towards her. He then stops and at 36.4 seconds reaches out with his left hand towards Angela. Simultaneously, Angela moves closer to the camera with her face filling the right side of the frame and her mouth opening as if she is screaming. At 38.8 seconds, the close up of Angela's face changes to an extreme close up of her nose and mouth, which is juxtaposed with the zombie's hand in a close up shot nearly touching her.



Figure 5.18. At 35.7 seconds viewer 7 reacts with an 'Extended Fear' level1 response.

The sequence attempts to construct empathy in two ways. First, Angela's facial expressions of terror are juxtaposed with the zombie holding a hammer, making the zombie more threatening as he moves closer to Angela. Secondly, Angela's anticipating an imminent attack from the zombie with him being very close to her shown by her open mouth (scream). When turning to viewer mediation peak responses, this sequence produced 27.7% of total 'Extended Fear' level 1 responses from the film clip and a small quantity of total of 'Momentary Fear' level 1 responses. This indicates that, for these viewers, sequence 4 was more likely to elicit a prolonged anxiety response with a high level of anxiety. Viewer 5 (male) was a multi-mediation peak responder, who reacted with an 'Extended Fear' level 1 response at 35.2 seconds and he explains how this sequence was stressful to watch:

> I think that the most stressful thing was the fact that she was having to be so quiet. Because you could see so clearly on her face that she wanted to scream, or shout, or just cry, or something. And it was really tense watching her not be able to do it (viewer 5).

Viewer 5 describes his empathetic response for Angela, because he felt stressful when watching Angela suffering and she was unable to scream out loud. When considering viewer comments regarding empathy, 47.3% of viewers implied that they empathised for Angela. In particular, many viewers mentioned the juxtaposition between Angela and the zombie and the synchronised zombie's body movements as he walks closer to Angela.

Moreover, her facial expressions of fear were very important in the construction of empathy and suspense. For example, viewer 25 (male), who reacted with a 'Momentary Fear' level 3 at response, said:

> The camera angle, the very dark room, and the fact that the camera concentrated a lot on the actress and how scared she looked, and also the ambiguity of the person standing behind and the sound effects created a lot of suspense (viewer 25; my emphasis).

Viewer 25 implies that the combination of Angela's facial expressions with her juxtaposed with the zombie, made him empathise for Angela. This demonstrates that the close ups and extreme close ups that show Angela in a state of terror, combined with the threat of the zombie within the same frame, constructs a strong empathetic

response in the viewer. Turning to viewer comments regarding her facial expressions of fear, many were brief but implied that facial expressions of fear were instrumental in eliciting an empathetic response with phrases such as: Viewer 7 (female) 'You take your emotion from the woman's face', viewer 15 (male) "the fact that the camera concentrated a lot on the actress and how scared she looked" and viewer 22 (male) 'I think the actress, fear on the face was…stood out for me'. All of these viewers reacted with 'Extended Fear' level 1 responses during one of the four film sequences, which demonstrates that the construction of empathy in the *Quarantine* vicarious suspense clip is associated with prolonged anxiety response at the highest level. Therefore, viewer mediation peak responses and viewers' comments demonstrate that this sequence successfully constructed empathy because of the actress's performance by Jennifer Carpenter.

Her performance constructs empathy through her being able to create specific facial expressions that successfully conveyed Angela's feelings of terror, combined with her body movements, such as moving closer to the camera or pulling away from the camera lens. Another layer to Jennifer's performance was with her interaction with the zombie, where they synchronise their body movements together. For instance, when the zombie's left hand reaches out towards Angela she moves away from the zombie and closer to the camera, creating an extreme close up of her face (Figure 5.19).



Figure 5.19. At 36.9 seconds viewer 20 reacts with an' Extended Fear' level 1 response.

This synchronised performance between Angela and the Zombie is also reversed at 37.1 seconds with the zombie pulling his left hand away from Angela and at the same time Angela pulling away from the camera showing a close up of her face and fingers. These synchronised movements between Angela and the zombie underscore the juxtaposition between them and the zombie's threat to Angela's life. Each of the four film sequences successfully construct empathy, with each one adding another layer of threat towards Angela and climaxing in the final sequence. This final sequence was the most successful due to the juxtaposition between Angela and the zombie and the zombie walking towards Angela with a hammer in his hand. Viewer mediation peaks and viewer comments also demonstrate how the performance of Jennifer Carpenter communicated her expressions of fear successfully through her facial expressions.

Case study 6 - *Silent House* composite suspense

This 89.0 second film clip, which was discussed in chapter 4, shows the protagonist Sarah (Elizabeth Olsen) sitting alone in the passenger's front seat of a car, alone in the dark and scared of being attacked by an unknown antagonist. The interrogation of the construction of empathy will involve the analysis of two short film sequences from the film clip. Both film sequences were selected because they produced different high anxiety responses in the viewer, with a cluster of 'Extended Fear' level 1-2 responses during sequence 1 and a cluster of 'Momentary Fear' level 1-2 responses during sequence 2. This indicates that these viewers either experienced a prolonged anxiety response in the first sequence and a condensed anxiety response in the second sequence with both sequences eliciting high levels of intensity.

The analysis of both film sequences will focus on a range of close ups of Sarah's face, which show different facial expressions, head movements and blood stained clothing. Elizabeth Olsen's acting performance will also be analysed in terms of how she conveys Sarah's emotional state to the viewer. Based on viewer mediation peaks and viewer comments, *Silent House* was successful in constructing an empathetic response for Sarah, even though the viewers did not see the antagonist. This meant that an empathetic response for Sarah was heavily reliant on Elizabeth Olsen's acting performance and mise-en-scène regarding Sarah's a blood stained top and head

movements. The discussion will start with a brief description the story context at the beginning of the film clip, because of the causal link in the construction of empathy for both film sequences.

Empathy Sequence 1:18.2-35.3 seconds

Sarah is in a car alone, in the dark and looking up at an LCD message by the rear view mirror that has the message 'the liftgate is open', referring to the boot of the car. Sarah hesitantly looks behind her in the direction of the liftgate but finds the liftgate closed. This is when the first sequence starts with the camera showing a close up side view of Sarah's face and shoulders, with her wearing a blood stained top as she looks in the direction of the liftgate with a pensive expression on her face. Her facial expressions cue the viewer that she is concerned about a threat coming from the rear of the car. Meanwhile, Sarah's blood stained top underscores viewers concerns for Sarah's safety and prompts viewers to ask questions, such as: has Sarah been previously attacked by someone or something and is she injured?



Figure 5.20. Sarah hesitantly turns her head to look in the direction of the liftgate showing her blood stained top.

The construction of empathy is attempted through the combination of Sarah's blood stained top and her facial expressions (pensive look), as she looks towards the liftgate. This cues the viewer that Sarah may have been attacked before and is concerned about

a threat coming from the liftgate, which invites the viewer to be concerned for her safety. Some viewers recalled Sarah's blood stained top in their comments, saying that it added tension to the scene, as indicated by viewer 14 (female), a multi-mediation peak responder, who said: 'The fact that the woman had blood on her clothes and she looked quite dishevelled, added to my sense of fear and intense worry and trepidation' (viewer 14; my emphasis). The comment from viewer 14 implies how the close up of Sarah's blood stained top was a signal for her to feel 'intense worry' for Sarah's wellbeing and watching Sarah's appearance made her feel scared. Other viewer comments also refer to the blood stains on Sarah's top as making them feel 'nervous'. Viewer comments indicate that Sarah's blood stained top created a perceived threat, because viewers did not know if it was her blood or someone else's. Based on viewer comments, mise-en-scène plays an important role in the construction of empathy, in terms of wardrobe (top) and make-up (blood) combined with cinematography, such as showing Sarah's pensive look towards the liftgate, cueing the viewer to where a perceived attack is more likely to occur.



Figure 5.21. Sarah's pensive look when she discovers the liftgate is closed

At 20.2 seconds, the close up of Sarah' face and shoulders show her slowly turning her head away from the direction of the liftgate and towards the viewer. When Sarah's

face is looking in the direction of the viewer at 27.0 seconds she looks beyond the viewer and outside of the car windows (off-screen) and towards the front of the car looking through the windscreen at 35.3 seconds. This segment (20.2-35.3 seconds) of sequence 1 attempts to construct empathy with a close up of Sarah's whole face, allowing the viewer to gain access to all of Sarah's facial expressions as she turns her head slowly towards the viewer. The 20.2-35.3 second segment also prompts viewers to anticipate that Sarah could be suddenly attacked by an unknown antagonist at any moment and from any direction. Based on viewer mediation peak responses we can determine when viewers were most anxious about Sarah's safety during sequence 1. From a total of mediation peaks during 28.9-35.3 seconds 60% were 'Extended Fear' responses compared to 40% being 'Momentary Fear' and 66.6% of the 'Extended Fear' responses were levels 1-2 compared to 33.3% of 'Momentary Fear' responses being level 1-2. This indicates that viewers who reacted with a mediation peak response during 28.9-35.3 seconds, were more likely to experience a prolonged anxiety response at a high level of intensity (Figures 5.22-5.25).



Figure 5.22. Sarah left of the frame is close up, with her turning her head towards the viewer at 23.0 seconds.



Figure 5.23. Sarah in close up turning her head towards the viewer at 25.0 seconds.



Figure 5.24. At 28.1 seconds viewer 15 reacts with an 'Extended Fear' level 1 response.



Figure 5.25. At 31.8 seconds viewer 17 reacts with an 'Extended Fear' level 1 response.

It is relevant to recall that when we empathise for someone who is suffering in some way, we experience a fear response (Caes et al. 2012). This provides evidence as to why viewers experienced a high state of anxiety during 28.9-35.3 seconds when they watch Sarah's pensive expression and that they were concerned for Sarah's safety, due to the perceived threat of attack from an unknown antagonist. Viewer comments said that a combination of factors made them feel anxious for Sarah's safety, such as Sarah's blood stained top and her facial expressions, which created feelings of 'suspense' and 'fear'. Viewers also implied that they were in tune with her emotional state, because the camera focused on her facial expressions. For example, Viewer 15 (male), who was a multi-mediation peak responder, reacted with an 'Extended Fear' level 1 response at 28.1 seconds, and explained: 'Also the camera was always facing the actress, so it was focussed on the fact that she was very frightened.' Viewer 15's comments indicate that he was drawn to her facial expressions of fear, which implies that he empathised for Sarah and that actress Elizabeth Olsen was successful in conveying Sarah's anxiety.

Empathy Sequence 2: 69.6-82.0 seconds

The second sequence in the clip begins with a close up of Sarah's face in profile, looking in the direction of the liftgate and discovering that it is open, though the liftgate itself is off-screen. The close up reveals her facial expressions, and shows that she is very upset and anxious about her discovery of the liftgate being open. This close up of Sarah attempts to construct empathy through her reaction to the liftgate being open with her feeling vulnerable to attack from an unknown antagonist. The perceived threat of an unknown antagonist combined with Elizabeth Olsen's acting performance attempts to draw the viewer deeper into Sarah's anxieties and cues the viewer that a sudden unexpected attack from an antagonist is very likely. From 72.2 seconds, the close ups of Sarah reveal additional facial expressions of terror, such as turning the corner of her lips downwards, tears in her eyes and very slow head movement. At 78.0 seconds, the camera pans to the left of the frame so that Sarah's head fills the right side of the frame, showing her face in extreme close up (Figure 5.26). This prepares the viewer to watch a similar camera shot sequence that occurs during 28.9-35.3 seconds (sequence 1), but in sequence 2 the viewer watches Sarah's face in extreme close up. At 79.2 seconds, Sarah starts to move her head towards the viewer very slowly, maintaining her very distressed emotional state shown by her facial expressions of terror, with tears in her eyes.



Figure 5.26. At 72.2 seconds Sarah is in close up looking in the direction of the opened liftgate with tears in her eyes and her corners of her mouth pulled downwards.



Figure 5.27. At 76.0 seconds viewer 7 reacts with a 'Momentary Fear' level 1 response.



Figure 5.28. At 78.3 seconds viewers 16 and 20 react with 'Momentary Fear' level 1 responses.

Sarah's slow head movement combined with the extreme close up of her face during 79.2-82.0 seconds attempts to construct empathy in the following ways. First, the extreme close up reveals more details of Sarah's facial expressions of terror, inviting

viewers to empathise with Sarah's feelings of fear and high anxiety. Secondly, the viewer is anticipating an imminent attack on Sarah from an unknown antagonist. We can identify the most suspenseful segment of the sequence based on viewer mediation peak responses. During 76.0-82.0 seconds 70% of total mediation peaks were 'Momentary Fear' responses with 40% being level 1. This indicates that viewers were more likely to respond with a condensed anxiety response, with some viewers experiencing the highest level of intensity. For these viewers, their anxiety was driven by the fact that Sarah could be attacked at any moment from any direction and they were concerned about what would happen to her. For example, viewer 18 (female), a multi-mediation peak responder, who reacted with a 'Momentary Fear' level 1 response at 81.8 seconds (Figure 5.29), explains how anticipating of a threat towards Sarah constructed empathy:

> It's very intense, the way the slow camera angle's moving. It leaves you anticipating what she's going to see, constantly feeling on edge, waiting for something to jump out…the angles are good, and the darkness, not really being able to see but knowing that there is something there (viewer 18; my emphasis).

Viewer 18's comments imply how the combination of cinematography, acting and the prospect of something jumping out at her, constructed an empathetic response, with viewer 18 and Sarah sharing tension as they anticipate an imminent attack on Sarah from an unknown antagonist.



Figure 5.29. At 81.8 seconds viewer 18 reacts with 'Momentary Fear' level 1 response.

When turning to viewer feedback comments, viewers mentioned Elizabeth Olsen's performance as convincing in communicating Sarah' emotional state, for example viewer 11 (female), a multi-mediation peak responder, said: 'The acting was good in that one as well because she clearly looked a lot more terrified than people mostly do in horror films'. The comment from viewer 11 underscores Sarah's emotional state as she turned her head slowly towards the viewer, revealing her facial expressions of terror. Viewer 11's comment also implied that she empathised for Sarah because Elizabeth Olsen successfully conveyed Sarah's fear through her facial expressions.

Comparison of Empathy Sequences 1 and 2

Both film sequences in the *Silent House* clip successfully demonstrate the construction of empathy by enabling the viewer to access Sarah's emotional state through close ups and/or extreme close ups of her face and/or the blood stained top. The close ups and extreme close ups of Sarah's face focused the viewers' attention on how the actress Elizabeth Olsen, conveys her emotional state through different types of facial expressions, head and body movements. Sequence 1 communicated Sarah's perceived threat from the liftgate, with her facial expressions showing a pensive and anxious look. The cluster of 'Extended Fear' level 1-2 responses during sequence 1 demonstrates that when viewers are shown a perceived threat towards the protagonist, the viewer is more likely to experience a prolonged anxiety response at a high level of intensity, even though there is no visible threat or antagonist.

Sequence 2 builds on the perceived threat to Sarah's life, indicated by her blood stained top and that an unknown antagonist is likely to attack her from the open liftgate. The perceived threat in sequence 2 is intensified with Sarah's face shown in extreme close ups and her facial expressions changing from pensive to terror. This is indicated by the lip corners of her mouth being turned down and tears in her eyes, which underscore her emotional state of terror. Sarah's agitated emotional state is reflected in viewer responses with a cluster of 'Momentary Fear' level 1 responses occurring during the most suspenseful segment (76.0-82.0 seconds) of sequence 2. This indicates that these viewers empathised with Sarah with a condensed anxiety response because they responded to Sarah anticipating an attack on her from an

unknown antagonist. This is because they knew Sarah was more vulnerable to being attacked than in sequence 1, because the liftgate was open. Tension increases in sequence 2, because viewers are still unaware of the antagonist's identity and where he will strike.

What is most interesting about the two sequences is the similarities between segment 28.9-35.3 seconds from sequence 1 and the segment 76.0-82.0 seconds from sequence 2. The camera shot segments of sequences 1 and 2 maximise viewer empathy using a similar pattern of camera close ups or extreme close ups when Sarah turns her head very slowly from looking in the direction of the liftgate and towards the viewer. The discussion will now turn to a case study, where the construction of empathy was less successful when combining close ups, and medium shots in *Grave Encounters 2* composite suspense, with the exception of when the protagonist is seen approaching the antagonist within the same frame.

Case Study 7 - *Grave Encounters 2* Composite suspense

During this 51.0 second film sequence, a group of friends explore a dark abandoned mental hospital and discover a supernatural force that produces a variety of demonic spirits that attack them. The construction of empathy will be analysed using two short film sequences from the film clip that use close ups or medium shots of three protagonists and a long shot of the antagonist, who is a supernatural force controlling a child's rocking horse. Sequence 1 demonstrates how using a close up and medium shot that show two protagonists (Tessa and Jennifer) in the same frame with a perceived threat of the supernatural force did not elicit an empathetic response in viewers. Whereas sequence 2 was more successful at constructing empathy, with a close up of the protagonist's face (Alex) followed by a medium shot of him walking towards the child's rocking horse in the same frame.

Empathy Sequence 1: 16.6-18.01 seconds

The film clip begins as viewers watch Tessa, Jennifer and Alex enter a children's ward and come across a child's rocking horse that is moving of its own volition, giving the impression it is being controlled by a supernatural force. This is followed by the first

sequence beginning at 16.6 seconds into the film clip (see figure 5.30). Tessa and Jennifer are shown standing still and looking in the direction of the right side of the frame at towards the rocking horse, which is off screen. Tessa is shown in the foreground on the left side of the frame in a close up, showing a profile view of her facial expressions of fear. Jennifer is positioned in between the foreground and background in a medium shot, with a side view of her face. With Jennifer being further away from the viewer and her face is hidden by a dark shadow, her facial expressions cannot be seen. At 16.7 seconds, the camera moves towards Tessa looking over her right shoulder, with a close up of her face and a side view of Jennifer's face and upper body in medium shot (Figure 5.31).



Figure 5.30. At 16.6 seconds Tessa is left of frame in a close up and Jennifer in the distance. Bother are looking in the direction of the child's toy rocking horse.

These camera shots (Figure 5.30 and 5.31) attempt to construct empathy using cinematography in two ways: firstly, with the cameraman walking towards Tessa using a Steadicam to draw the viewers' attention to Tessa's facial expressions of fear as she looks in the direction of the rocking horse. Secondly, the camera position creates a juxtaposition between Tessa and Jennifer, which provides a visual illusion of them being closer together. This means that the viewer takes the emotional state of both

Tessa and Jennifer from Tessa's facial expressions, because Jennifer is still shown in the distance in a medium shot. Based on viewers' mediation peak responses, this short sequence produced one mediation peak response indicating it failed to elicit an empathetic response for Tessa and Jennifer.



Figure 5.31. The juxtaposition between Tessa and Jennifer.

As previously explained in this section, viewers need to experience a strong anxiety response to empathise with a character. This would be indicated by a cluster of either 'Extended or Momentary Fear' responses at level 1-2. The reasons why sequence 1 did not elicit an empathy response for Tessa and Jennifer is because of the following factors: First, the close up of Tessa's face is in side view, limiting viewers' access to her facial expressions. Secondly, Tessa's face is not dominant within the frame in terms of physical size (see examples of *Silent House* and *Quarantine* in this section), which is essential to draw viewers' attention to the character's facial expressions. Thirdly, Jennifer's acting and position in the frame contribute little to the construction of empathy, because she is standing further away from the viewer in a medium shot, making it difficult for viewers to access her facial expressions. When considering viewer comments, none mentioned any concerns for the safety of Tessa or Jennifer.

Empathy Sequence 2: 18.2-20.3 seconds

The second film sequence immediately follows sequence 1 and begins with the camera panning to the right showing a close up of Alex's face, who is positioned on the right side of the frame looking directly at the viewer. The close up shows Alex's head as the most dominant feature in the frame. The camera then zooms in on Alex's face, synchronised with him turning his head away from the viewer and looking downwards in the direction of the child's rocking horse (off-screen).



Figure 5.32. At 18.2 seconds' viewers watch a close up of Alex's face before he confronts the supernatural force controlling the child's toy rocking horse (off-screen).



Figure 5.33. At 19.0 seconds viewers watch Alex looking at a child's toy rocking horse (off-screen).



Figure 5.34. At 19.2 seconds viewer 2 reacted with an 'Extended Fear' level 1 response.

At 19.2 seconds, viewers watch a medium shot of Alex's legs walking towards the rocking horse in the background. Alex continuously walks slowly towards the moving rocking horse, with the sequence ending at 20.3 seconds. Based on mediation peak responses, this sequence was more successful at eliciting a strong fear response than sequence 1. From a total of mediation peak responses during this sequence 55.5% were 'Extended Fear', with 80% being an 'Extended Fear' level 1-2 response, indicating that viewers were more likely to respond with a prolonged anxiety response. Sequence 2 attempts to construct empathy initially with a close up of Alex's face that dominates the right side of the frame and invites viewers to focus on his facial expressions. Although his facial expressions show less anxiety than one might expect when confronting a supernatural force, when he turns his head to the left of the frame in the direction of the rocking horse, this cues the viewer that Alex will confront the supernatural force. Alex in a medium shot walking towards the moving rocking horse attempts to maximise empathy for him, because it cues viewers that he is most vulnerable to being attacked by the supernatural force.

When turning to viewer comments, 45% of viewers mentioned the moving rocking horse as being 'suspenseful', 'a bit creepy' or made them feel 'scared'. Viewer anxieties about the child's rocking horse would have encouraged them to empathise for Alex when he approached the rocking horse. For example, viewer 27 (male), a multi-mediation peak responder, said that what stood out most was 'The rocking horse, and the man moving towards it', which implies that he was concerned for Alex's safety when walking towards it. These viewer comments inform us that empathy is likely to develop during a potential confrontation between the protagonist and the antagonist when both are within the same frame, even if they do not see the protagonist's facial expressions. However, sequence 2 was less effective in producing a very strong empathetic response, compared to what was demonstrated in *Silent House* composite suspense and *Quarantine* vicarious suspense. Both film clips constructed empathy using a continuous stream of close up and extreme close ups of the protagonist, revealing their facial expressions of fear and terror. This demonstrates that for the viewer to develop a strong empathy connection for a fictional character it depends on whether the character is in a state of terror and that the viewer can gain access to how the character feels. Based on the film clips that elicited such a strong empathetic response *Quarantine* and *Silent House* it seems important that the viewer accesses the characters feeling more easily through close ups and extreme close ups of the character's facial expressions.

Empathy: Character Vocal and Inanimate Object Sounds

Case study 8 - *Quarantine* vicarious suspense

It is informative to turn to *Quarantine* again, because it demonstrates how character vocal sounds and acousmatic sounds of inanimate objects were successful in constructing empathy. These vocal and inanimate sounds (Figure 5.35) elicited 78.8% of the total 'Extended Fear' level 1 responses from the 40.0 second film clip, indicting these viewers experienced a prolonged anxiety response at the high level of intensity. The two vocal sounds include: 1) Angela's very quiet scream, similar to the loudness and pitch of Sarah's whimpering cries in the *Silent House* direct suspense clip. 2) The antagonist's (zombie) groans. Both vocal sounds combined were found to be more

successful at eliciting the highest quantity of 'Extended Fear' level 1 responses, compared to acousmatic metallic sounds of inanimate objects. Vocal sounds generated 44.4% of total 'Extended Fear' level 1 response from the film clip, compared to the inanimate objects with 33.3%. The analysis will focus on how inanimate and vocal sounds attempt to construct empathy through repetition. First, the discussion will analyse how the acousmatic metallic sounds 1 and 2 attempt to construct empathy, with both sounds being perceived as a threat to Angela.

No	**Time (seconds)**	**Most dominant sound**	**Loudness level**	**Pitch**	**'Extended Fear' responses (by quantity)**
1	4.0	Metal object striking a metal surface (metal object sound)	High	Low	2
2	11.0-12.0	Metal object crashing against another hard surface	High	Low	3
3	14.0	Antagonist (zombie) croaky groan	low	Low	1
3	17.0-20.0	Antagonist (zombie) croaky groan	low	Low	0
4	21.0	Female protagonist scream	Low	Medium-High	1
1	22.0	Metal object crashing against another hard surface	High	Low	1
4	26.0	Female protagonist scream	Low	Medium-High	0
2	27.0	Metal object crashing against another hard surface	High	Low	0
2	30.0	Metal object crashing against another hard surface	High	Low	0
3	31.0-32.0	Antagonist (zombie) croaky groan	Low-medium	Low	1

4	35.0	Female protagonist scream	Low	Medium-High	2
3	36.0-39.0	Intermittent Antagonist (zombie) croaky groan	Low-medium	Low	3

Figure 5.35. Table 7 – Quarantine vicarious suspense: vocal and acousmatic inanimate object sounds.

Sound 1 - Metal Object Striking a Metal Surface

The acousmatic sound of a 'metal object striking a metal surface' has a high level of loudness and low pitch and occurs abruptly and unexpectedly. To simplify the description, sound 1 will be referred to as 'metal object sound', as indicated in table 7. At 4.0 seconds into the film clip, viewers hear an unexpected, discordant sound of a metal object, which acts like the traditional horror 'stinger' to startle the viewer and cue them of the threat and aural presence of the antagonist (off-screen) (Hutchings, 2004: 131). The metal object sound attempts to elicit a strong anxiety response about Angela's safety, as she cannot see in the dark and is defenceless.

According to Jennifer Van Sijll, viewer anxieties increase when they listen to loud metallic sounds because they are perceived as eliciting a negative emotional response and represent the presence of the antagonist (Sijll Van, 2005: 94). She gives an example from the film *E.T. the Extra-Terrestrial* (Steven Spielberg, 1982), where at the beginning of the film, a group of men who have keys attached to their waist search for ET: 'They carry huge keys on their waistbands that jangle as they rush in pursuit of ET. The sound of the keys is immediately coded as the sound of the approaching antagonists' (Sijll Van, 2005: 94). Sijll's comment of a 'coded sound' describes the 'stinger', an aural signature of the antagonist's presence. When we turn to viewer mediation peak responses for sound 1, it produced 14.2% of total 'Extended Fear' level 1 responses across all 4 sounds and was only played once at the beginning of the film clip. For these viewers, the threatening nature of the 'metal object sound' was effective in eliciting a strong anxiety response.

Sound 2 - Metallic Crashing Sound

The acousmatic 'metal crashing sound' is repeated 4 times (11.0-12.0, 22.0, 27.0 and 30.0 seconds) during the film clip. This acousmatic sound is best described as a heavy metal object being thrown or dropped onto another metallic surface. Sound 2 has a high level of loudness and a low pitch, which attempts to construct empathy in the same way as sound 1. For example, the metal crashing sound increases viewers' anxieties because it occurs unexpectedly in an attempt to unease the viewer by cueing them that an unknown antagonist is nearby and a threat to Angela. Viewer anxieties increase because the viewer cannot see the visual source of the sound nor who is making the sound and why. This invites viewers to make assumptions about the threatening nature of the sound, such as whether it could be a weapon and used against Angela. When we consider total 'Extended Fear' level 1 responses across the 4 sounds during the film clip, sound 2 elicited 28.6% 'Extended Fear' level 1 responses.

Turning to viewer comments, 25% of viewers mention 'the noises' and it is reasonable to infer that they were talking about sounds 1 and 2, because they were the loudest discordant sounds with a low pitch producing a 'noisy sound'. Viewers' comments mention how these two acousmatic sounds were difficult to define, because their visual source was not present. For example, viewer 7 (female), who was a multi-mediation peak responder, said: 'the sound's not too distinct, you don't really know what you're hearing either.' Viewer 7's comments imply that both sounds were ambiguous, which would have increased viewers' anxieties, indicated by the clusters of 'Extended Fear' level 1 responses. Sounds 1 and 2 construct empathy first, by being ambiguous with a discordant tone and very loud with a low pitch, and, secondly, through the sound occurring unexpectedly. This combination of factors cues the viewers of a serious threat that could be a weapon and used against Angela. Thirdly, both sounds cue the viewer of an unknown threat to Angela that triggers the viewers' imagination to create a visual source that represents the inanimate objects, such as a weapon. Fourthly, the viewers can see that Angela's anxieties are heightened because she is aware that sounds 1 and 2 represent the presence of the antagonist and that her life is in serious danger.

Turning to viewer mediation peak responses, sound 1 produced 14.2% of total 'Extended Fear' level 1 responses across all 4 sounds compared to Sound 2 with 28.6% of 'Extended Fear' level responses. These findings initially suggest that the metal crashing sound (sound 2) was more successful in the construction of empathy by being more threatening to Angela's safety than a metal object sound (sound 1). When taking into consideration the times these sounds occurred, sound 1 was heard once during the film clip compared to sound 2, which was heard 4 times, indicating sound 1 was more efficient in producing a strong anxiety response than sound 2. Moreover when sound 2 was repeated during the film clip it was found that viewer 'Extended Fear' level 1 responses declined the more times the sound was heard and it did not elicit any 'Extended Fear' level 1 responses during 27.0 and 30.0 seconds. With both sounds 1 and 2 being metallic, loud and having a low pitch indicates that these types of acousmatic sounds are successful at eliciting a strong anxiety response initially, with a decline in anxiety on repetition. This reduction in viewer's anxiety responses is similar to the repetitive pattern of the sound from the Polaroid camera and lighting from the three camera flashes of light in the *Silent House* direct suspense clip. The repetitive sounds of inanimate objects from *Quarantine* and *Silent House* in particular demonstrate that inanimate object sounds used repeatedly through a film clip will diminish suspense through habituation. We shall now turn to the vocal sounds from Angela and the antagonist the zombie.

Zombie Groans

The zombie groans (sound 3) consist of a croaky groan, which has a low-to-medium level of loudness with a low pitch. The croaky groans produced a very discordant animal predatory sound that attempts to construct empathy by cueing the viewer that the zombie's voice is threatening. The zombie groans are first heard by viewers on 14.0 seconds and then repeated during 17.0-20.0, 31.0-32.0 and 36.0-39.0 seconds. The total duration of the zombie groans was 10.0 seconds, which is 25% of the film clip's duration. This informs us that the predatory zombie groans had more exposure than the acousmatic inanimate metal object sounds 1 and 2, indicating the zombie's groans presented the greatest threat to Angela. From a total of viewer 'Extended Fear'

level 1 responses across the 4 sounds, the zombie groans produced the highest quantity of 'Extended Fear' level 1 response with 35.7%.

Unlike the metal crashing sound (2) that saw a decline in eliciting 'Extended Fear' level 1 responses after the first time it was heard, the zombie groans eliciting 60% of the total 'Extended Fear' level 1 responses during its fourth aural sequence 36.0-39.0 seconds. This indicates that the zombie groans was more likely to construct empathy because the Zombie's vocal sound was like a predator's sound and a more serious threat to Angela's life (Blumstein et al. 2012: 4), compared to the inanimate metal object sounds 1 and 2. Moreover, with the zombie groans becoming louder as he approached Angela and increasing in frequency they become more threatening, climaxing towards the end of the film clip. Although not many viewers mentioned the zombie groans, the majority of viewers did say that the zombie was 'weird', 'creepy' and 'freaky' and a serious threat to Angela's life. Viewer 23 (female), a multi-mediation peak responder, explains how the zombie groans added to the threat of the zombie: 'And the zombie kept making sound, making noise. And the girl couldn't do anything. A bit dangerous for her and unsafe.' Viewer 23's comments imply that the predatory nature of the antagonist vocal sounds underscores the serious physical threat of the zombie, inviting viewers to empathise for Angela, who is helpless and vulnerable to attack.

Sound 4: Angela's Scream

Angela's scream was the quietest sound, with a low level of loudness and a medium-to-high pitch. Angela's scream produced an upshift in her vocal pitch, which should, according to Blumstein et. al., result in viewers experiencing high arousal (Blumstein et al. 2012: 4). Angela's scream is a low level of loudness and has an upshift in pitch similar to Sarah's whimpering cries in the *Silent House* direct suspense film clip and not like Sarah's loud scream when she saw the image of a young girl in the corridor producing a much weaker mediation peak response. We can confirm this from viewer mediation peak responses that occurred during Angela's screams, which elicited 21.4% of total 'Extended Fear' level 1 responses across all 4 sounds when they heard her scream. Bearing in mind that the total duration of Angela's screams was three

seconds (21.0, 26.0 and 35.0 seconds), which is 7.5% of the duration of the film clip compared to the zombie groans with 25%, indicating that Angela's screams were the most successful sound at eliciting a prolonged anxiety response at the highest level. Like the zombie groans, Angela's screams elicited a high quantity of 'Extended Fear' responses on repetition. When considering viewer comments, 25% of viewers mentioned Angela's screams. In particular, viewer 16 (male), a multi-mediation peak responder who reacted with an 'Extended Fear' level 1 response, felt scared when he heard her scream: '…the fear in her voice, actually made me feel really scared…'. Viewer 16's comment implies that he was scared for Angela, indicating he empathised with Angela because of the serious threat posed by the zombie nearby.

Although the two acousmatic metal inanimate objects initially constructed empathy during 4.0 and 11.0-12.0 seconds by representing an ambiguous threat to Angela's life, their effectiveness declined on repetition, indicated by the metal crashing sound (2) which did not elicit an 'Extended Fear' level 1 responses during the last two times sound 2 was heard. When comparing the two metal inanimate object sounds 1 and 2, with the vocal sounds of Angela and the zombie combined; the vocal sounds were more successful in the construction of empathy than the metal inanimate object sounds. The discussion with now turn to how mise-en-scène attempts to construct empathy through facial make-up of two antagonists, making them appear frightening.

Empathy: Mise-en-scène and Characterisation

According to Richard Barsam, mise-en-scène is what we see and hear on screen and creates the feel and atmosphere of the story world (Barsam, 2007: 92). In a horror film, mise-en-scène can assist in the viewer in forming an empathetic response for the protagonist using costume design and make-up. For example, in the previously discussed case study of the *Silent House* composite suspense clip, Sarah's blood stained top prompts viewers to ask questions about Sarah's wellbeing, such as: has she been attacked, injured and if so, who was it that attacked her and are they still a threat to her life? Facial make-up attempts can make an antagonist appear frightening, producing a strong anxiety response in the viewer and assisting in the development of empathy for the protagonist. To explore this in more detail I will return to the *Sinister*

composite suspense clip in order to analyse the role of make-up in relation to two antagonists and the construction of empathy. The discussion will also include an analysis of cinematography, the antagonist movements and the protagonist's (Ellison) reaction when confronted by two antagonists, 5 dead children and a demon in the loft of his house.

Case study 9 - *Sinister* composite suspense

The discussion will analyse a short film sequence (51.5-68.2 seconds) from the 68.2 second film clip to discover how mise-en-scène attempts to construct empathy through make-up of two different antagonists. Based on viewer mediation peak responses and viewer comments, viewers were scared when watching the young dead children and demon; however, there was little evidence of and empathetic response for Ellison.

Antagonist 1 - Five Dead Children

The sequence begins at 51.5 seconds, with viewers watching a long shot of 5 dead children sitting down looking at a film being projected on a wall in the loft of a house (Figure 5.36). Then suddenly, all 5 children turn their faces slowly away from the film and towards the viewer and Ellison (off-screen) (Figure 5.37). The children's faces appear to be decomposed, which is indicated by four layers of make-up. First a yellowish skin pigment, secondly, reddish-blue lips indicating their blood circulation has stopped, thirdly, the skin has a marbling effect of tiny cracks covering their faces and, fourthly, the skin tissue around their eyes is coloured black making them appear dead.



Figure 5.36. At 51.5 seconds viewers watch a long shot that shows the children watching a film in the loft of the house.



Figure 5.37. The viewers watch a long shot that shows the children turning their heads and looking directly at Ellison and the viewer.

At 55.6 seconds the shot changes to a close up of Ellison, looking through the loft entrance at the viewer and in the direction of the young children (off-screen) (Figure 5.38). Ellison looks very tense and concerned as he looks into the camera.



Figure 5.38. At 55.6 seconds viewers watch a close up of Ellison and his facial reactions to seeing the children (off-screen) looking at him.



Figure 5.39. At 57.8 viewer 27 reacts with an 'Extended Fear' level 2 response.

At 57.0 seconds, the young children are shown in long shot and slowly place their index fingers across their mouths to warn Ellison not to make a noise (Figure 39). This sequence attempts to construct empathy by eliciting a strong fear response in the viewer in the following ways. First, when the young children turn their heads slowly and look in the direction of Ellison, showing their dehumanised faces. This cues the viewer into the fact that the children are 'dead' and therefore pose a serious threat to Ellison's life. Secondly, when the children's slow head and hand movements are synchronised, it gives the impression they are being controlled by an unknown

supernatural force making them look frightening. When turning to total viewer mediation peak responses between 51.5-60.4 seconds, 71.4% were 'Extended Fear' and 80% of them were level 1-3 responses, indicating viewers were more likely to respond with a prolonged anxiety response at a medium-to-extremely high level of intensity. Viewer 7 (female), who reacted with an 'Extended Fear' level 4 response, explains how the children made her feel scared:

> And then at the top you see kids facing away, so you can't see their faces yet. And kids by themselves are just scary because they're usually innocent, and here they are being defiled, if that's the right word. And then they turn slowly, revealing their face (viewer 7)

Viewer 7's comments demonstrate how the make-up has transformed the young children's faces from innocence to non-human and she suggests how the children's slow head movements contributed to them being frightening.

Antagonist 2 - The Demon

At 60.5 seconds, a demon is shown in a long shot in the film the 5 dead children are watching (Figure 5.40). The demon then moves slowly forward towards the viewer, when suddenly the camera shot changes and the viewer watches a close up of Ellison's anxious face looking in the direction of the young dead children and demon (both off-screen). This sequence attempts to construct empathy, first, by presenting a new antagonist (the demon) who appears to be more threatening than the dead children. Secondly, the viewer watches Ellison's reaction to the children and demon, even though the demon is shown in a film projected on the wall in the loft. At 64.6 seconds the viewer watches a close up of the demon's face, which reveals different layers of make-up (Figure 5.41). The demon's eyes are the most dominant feature of his face, with two large triangular black shadows representing its eyes, making his face appear very threatening. His disturbing eyes are underscored by dark reddish patches around the demon's mouth, which cues the viewer that the redness might be blood. These facial features are combined with the demon's white and yellowish skin, cueing viewers that the character is not human. Furthermore, the demon's face being enlarged in the film on the loft wall attempts to present a strong threat to the viewer and Ellison.



Figure 5.40. At 60.5 seconds viewer 17 reacts with an 'Extended Fear' level 1 response.



Figure 5.41. At 64.6 seconds viewer 5 reacts with a 'Momentary Fear' level 1 response.

Then the camera point-of-view suddenly changes into a long shot of the demon, combined with the dead children sitting down in the foreground, looking in the direction of the viewer and Ellison (off-screen) with their fingers still on their lips (Figure 5.42).



Figure 5.42. At 66.0 seconds viewers watch a long shot of the dead children and the demon in the film on the loft wall who look directly at Ellison and the viewer.



Figure 5.43. At 68.2 seconds viewers watch a close up of the demon's face looking directly at Ellison and the viewer.

The sequence ends on 68.2 seconds when the viewer watches an extreme close up of the demon's face suddenly appearing on screen and looking directly at the viewer in an attempt to startle them (Figure 5.43). During this extreme close up some of the demon's facial features have changed in an attempt to make it more frightening. His

skin pigment has altered to a darkish pink-blue colour, in contrast with shades of white, combined with a white marbling effect across his cheeks. One of the most disturbing facial features that changed was the disappearance of his mouth, which attempts to maximise viewers' anxieties.

When we turn to viewer mediation peak responses between 60.5-68.2 seconds, 62.5% were 'Momentary Fear' levels 1-4 responses with 40% being level 1 and occurring during 61.5-65.5 seconds, when the viewers watch a close up of Ellison's face after he had first watches the demon's appearance on the loft wall. This indicates that these viewers experienced a condensed form of anxiety at the highest level when they see Ellison's facial reaction to seeing the demon for the first time. However, according to viewer 5 (female), she did not feel an empathetic response for Ellison. Viewer 5 was a multi-mediation peak responder and reacted with a 'Momentary Fear' level 1 response at 64.5 seconds (Figure 34), explains: '…You're sort of expecting something to jump out from what they're doing on screen…' Viewer 5's comments inform us that the 3.0 second sequence (61.5-65.5 seconds), when she watches a close up of Ellison's face, elicited a strong anxiety response about the prospect of seeing a startle stimulus rather than empathising for Ellison and his precarious situation.

Overall, the 55.1-68.2 seconds film sequence attempts to construct empathy through repetition of framing the protagonist and antagonists in separate shots, for example, the viewer first watches Ellison's face as he looks inside the loft which is followed by a long shot of what he is looking at, which initially is 5 dead children. This pattern of positioning the viewer with the fictional characters is then repeated with Ellison and the demon. The long shots of the children, followed by close ups and extreme close ups of the demon draws the viewers' attention to their faces and make-up to maximise the viewers' fear response. When we consider viewer feedback comments that refer to the young children and demon looking frightening, 70% of viewers mention the demon as being very frightening because it made them jump at the end of the film clip. Whereas 65% of viewer comments mention the young children as being very frightening, saying the young children were 'creepy' and had 'pale faces' and 'looked like they were dead'. Viewer 16 (male), who was a multi-mediation peak responder,

reacting with a 'Momentary Fear' level 1 response at 65.8 seconds, explains how the movements of both antagonists were frightening: '…when the children turned towards the camera the look on their face...it didn't look normal. And when the monster appeared right in front of the screen it gave me a fright.'

Based on mediation peak responses and viewer comments, make-up, body movements and the camera framing of both antagonists increased viewers' anxieties. However, based on viewer feedback comments there is less evidence to indicate that viewers empathised with Ellison's perilous situation. This is because the viewer did not observe Ellison being threatened by any antagonist within the same frame, which assists in the construction of empathy as illustrated previously in *Quarantine* and *Grave Encounters 2.* Furthermore, the way the viewer is positioned, with the antagonists in different shots, cues the viewer that they are the target of the antagonists' threats rather than it being Ellison. This narrative and cinematography technique is often used in horror films in creating a direct threat to viewer (Hutchings, 2004; Smith, S. 2000). This was also supported by viewer comments in how they described their fear response to both antagonists. So although the facial make-up of the antagonists was very successful in eliciting either a prolonged or condensed anxiety response at a high level, the camera framing of the characters made it more difficult for viewers to construct an empathetic response for the Ellison.

Conclusion

This chapter demonstrates how the EDA model of suspense measures viewer experiences of suspense to cinematic techniques (cinematography, sound and mise-en-scène) through two themes: firstly through concealing, delaying and revealing narrative information to the viewer and secondly through a viewer empathetic response with the protagonist. The EDA model of suspense was able to define film sequences within the case study film clips that either elicited a strong or weak anxiety response, in terms of anxiety durability and intensity. This provided a deeper insight into the understanding of how specific cinematic techniques construct suspense. In both themes, the case studies illustrate how suspense is constructed through cinematography, lighting, sound and to a lesser extent mise-en-scène. Each of these

cinematic techniques acts as a layer of story information to elicit viewers' anxieties through a direct threat from the antagonist or by observing the protagonist's reaction when they are threatened by the antagonist. Cinematography plays a significant role in constructing suspense by concealing or revealing story information within the frame and how this information is presented. For instance, the night-vision camera in *Quarantine* integrates cinematography with an artificial green light source within the camera lens, which fuses together cinematography with lighting (concealing and revealing information) and mise-en-scène by creating an eerie frightening atmosphere.

Composition of the frame (mise-en-scène) in terms of the spatial relationship between the protagonist and antagonist was found to be important in the elicitation of a strong anxiety response. For example, in *Quarantine* Angela is juxtaposed with the zombie and, to a lesser extent in *Grave Encounters 2* the spatial relationship is utilised when Alex walks towards a child's toy rocking horse and supernatural force (antagonist). Framing of the protagonist was also crucial for the viewers to understand what the protagonist was feeling. For instance, close ups and extreme close ups of the protagonist's face proved to be very successful in eliciting suspense and assisting the construction of empathy by enabling the viewers to see their facial expressions, thus revealing their emotional state. Viewers' anxieties increase significantly when the protagonist and antagonist are within the same frame (*Quarantine)* or when there is a perceived threat of an unknown antagonist, as in the case of the *Silent House* composite suspense clip, when Sarah was hiding in a car. Moreover, an empathetic response relied on the actor's performances such as Jennifer Carpenter (*Quarantine*) and Elizabeth Olsen (*Silent House*).

Turning to sound, in the *Silent House* direct suspense clip, the viewers had to rely on sound to understand the story context. Although initially this proved successful in eliciting a strong anxiety response when viewers heard Sarah's whimpering cries due to the upshift in pitch, the repetitive pattern of bright camera flashes of light and dark shots diminished suspense as the film clip progressed. The decrease in suspense was because viewers had to rely on sound to understand the story context and the concealment of important visual story information, such as Sarah's identity and why

she was so upset. The reduction in suspense was also due to some viewers quickly learning about the repetitive pattern of light and dark shots and knowing what to expect. However, acousmatic sounds that resonated with viewers as being threatening in *Sinister* composite suspense, where distorted voices singing a demonic chant combined with a non-diegetic sonic drone, were very successful in eliciting a stronger anxiety response when repeated. Moreover, the vocal sounds of Angela's scream with an upshift in pitch combined with the zombie groans in *Quarantine* were more successful in sustaining a strong anxiety response when repeated than acousmatic inanimate object sounds (metallic sounds), even though the metallic sounds were loud and threatening.

Although the cinematic techniques discussed in this chapter can be crucial to eliciting a strong anxiety response, they appear to become much stronger when working synergistically. For example, in *Quarantine*, the night-vision lighting was able to conceal the visual source of the inanimate objects and the zombie's identity from the viewer and also Angela. At the same time, night-vison lighting, close ups and extreme close ups reveal Angela's reaction through her facial expressions of terror to the threatening sound of the inanimate objects and the vocal sounds of the zombie groans. The way in which night-vision lighting and acousmatic sounds of inanimate objects were used in *Quarantine* vicarious suspense demonstrates how cinematography, lighting and sound underscore the story elements from Susan's Smith's suspense narrative structures. In the case of vicarious suspense, it is dependent on the viewer being privileged with information that the protagonists themselves are denied. The information that viewers were privileged with in the *Quarantine* film clip was the zombie and its location in relation to Angela, which elicited a strong anxiety response.

With the antagonist often being some kind of monster in a horror film, with the primary purpose to kill fictional characters and to scare the viewers, the findings from the experiment found that framing of the monster, non-diegetic sound and mise-en-scène underscored direct suspense. For instance, in the *Sinister* composite suspense clip, the demon's face movement is framed in close up with the demon looking directly at the viewer. His facial make-up makes him appear frightening. The shot is also

accompanied by a loud musical stinger to add another layer of direct fear by making viewers jump from their seats. Although the combination of make-up, framing and movement of the demon's face created a sudden fear response from viewers, the shot did not elicit mediation peak responses of a strong anxiety response. This result was found in all film clips that created such a sudden shock to scare the viewers, indicating that sudden scares in horror films are more likely to generate just a sudden shock rather than a significant anxiety response in terms of durability and intensity level.

The key cinematic techniques that encouraged viewers to share emotion with the protagonist was by generating a strong fear response were: cinematography, lighting and sound. For example, close ups and extreme close ups of the protagonists' faces in the *Silent House* composite suspense film clip and in the *Quarantine* vicarious suspense film clip, enabled viewers to access the protagonists' emotional state. In *Quarantine* this also involved lighting, so viewers were focussed on Angela's facial expressions of terror combined with the threat of unknown dangers in the dark that could threaten her life. As mentioned previously, acousmatic sounds of inanimate objects and vocal sounds of Angela's screams with an upshift in pitch elicited a stronger anxiety response and concerns for the protagonist's safety. These findings demonstrate that a viewer's empathetic connection with the protagonist can be created in different ways and across narrative structures (vicarious, direct and shared), which goes against Susan Smith's argument that a strong emotional bond between viewer and a fictional character can be achieved only through shared suspense.

The findings from the film experiment inform us that the construction of suspense in horror films involves the deployment of cinematic techniques (cinematography, lighting, sound and mise-en-scène), separately and together to conceal, delay and reveal story information and underscore narrative structures (vicarious, direct and shared suspense) involving a conflict between the protagonist and antagonist. In particular the framing of the fictional characters within the same frame where lighting can reveal the protagonist's suffering through their facial expressions of fear and the darkness conceal or delay the identity of the antagonist. Overall the findings illustrate that the controlling narrative information is important for the construction of suspense

and that if too little or too much information is shown this diminishes suspense. This means that a balance of information is required to elicit a prolonged anxiety response at an extremely high level of intensity, creating a strong form of suspense.

CONCLUSION

How can we measure cinematic suspense?

Although film scholars and media psychologists have produced many different definitions of cinematic suspense there is still no concise framework that can measures viewer experience of cinematic suspense. This thesis makes a valuable contribution to scholarly knowledge by providing such a framework through a psychophysiological model of suspense based on electrodermal activity (EDA). In order to develop this EDA model of suspense two main challenges had to be addressed: firstly, there is no clear definition of suspense as a process and its components that is cross-genre experience. Secondly, a new methodological approach was required to define viewer experience of suspense by synthesising research methods used by film scholars and media psychologists.

The first challenge for example, refers to definitions of suspense are which commonly associated with the cognitive state of uncertainty and emotions hope (positive outcome) and fear (negative outcome) concerning the protagonist(s) survival when threatened by an antagonist (Ortony et al. 1988: 131). With suspense being a cross-genre experience indicates that fear is not essential to suspense (Alfred Hitchock cited in Truffaut, 1985: 72) and in horror films hope is less likely to occur because one of the genre conventions of horror films is that most if not all of the protagonists will be killed (Jancovich, 1992: 104-105). Although the cognitive state of uncertainty is more likely to be present during the construction of suspense there are instances when uncertainty is not present, such as repeat viewings (Smuts, 2009; Hoffner & Cantor, 1990). Without clarity of what suspense is the researcher can never be totally sure what they are measuring when they attempt to measure suspense (Friedrichsen 1996: 329-330-338).

The aim of this thesis has been to develop a framework to measure viewers' experiences of suspense to gain an in-depth understanding of suspense and provide a valuable contribution to textual analysis of cinematic suspense. The first stage was to create a theoretical definition of suspense based on its process and components so that suspense could be accurately measured. In order to do this I drew on film scholars

(Grant, 2012; Young, 2012; Norden, 1980; Bordwell, 1985), media psychologists (Tan 1998; de Wied, 1994; Zillmann, et al.1994; Zillmann & de Wied, 1996; Zillmann, 1996; Friedrichsen, 1996) and psychophysiologists (Nomikos et al. 1968) to create a quantifiable framework of cinematic suspense that can be used to measure suspense. This led to identifying suspense as a mediation process within a cause-and-effect paradigm (Bordwell, 1985; Brewer & Lichtenstein, 1982), in three ways. First, in terms of plot development, an initiating event (cause) triggers the construction of suspense. This initiating event has a causal link to a specific outcome event (effect) that resolves suspense. Secondly, the initiating event (cause) and it causal link to the viewers' response (effect). Thirdly, the temporal qualities of the construction of suspense between the initiating and outcome events, such as other story events or cinematic techniques that are used to heighten suspense. This then offers a theoretical temporal framework to measure the construction of cinematic suspense.

Turning to the cognitive and emotional states as components of suspense, the cognitive state of anticipation is an important component in how we comprehend stories, such as anticipating about the goals of specific fictional characters in a story world (Tan, 1998; de Wied, 1994; Töpper & Schwan, 2008). During the construction of suspense, the viewer's anticipation about these narrative elements relating to the story world provoke an anticipatory stress reaction, eliciting varying types of anxiety, depending on the story context. For example two lovers embraced in a suspenseful kiss will create a weaker anxiety response (Alfred Hitchock cited in Truffaut, 1985) compared to a protagonist whose life is being threatened in a horror film (Zillmann, 1996; Zillmann, & de Wied, 1996; Hutchings, 2004) or when a threat from the story world is directed at the viewer (Smith. S, 2000). By identifying anxiety as a *phasic* emotion as an essential component of cinematic suspense, through a cause-and-effect paradigm, provides a framework to measure cinematic suspense through viewer anxiety responses. Horror films were selected for the 'Terror & Tension' film experiment because viewers were more likely to experience a stronger anxiety response than if other film genres were used. Suspense in horror feature films is created by fear acting as *tonic* emotion, however, with short films being used in the film experiment fear acts

as a *phasic* emotion through intermittent fear stimuli to scare the viewer, inducing a *phasic* anxiety response. This then formed the framework to measure viewer anxiety responses during the construction of suspense in horror films. This theoretical framework identifies the mediating process of suspense through a cause-and-effect paradigm, elicited through the *phasic* emotions of fear and anxiety. This framework enables the experimenter to measure cinematic suspense and viewer experience.

The second challenge concerning a framework to measure viewer experience of cinematic suspense is that methodological approaches taken by film scholars and media psychologists are diametrically opposed. Film studies qualitative technique of textual analysis is essential in terms of understanding narrative and cinematic techniques that form the construction of suspense. Although media psychologists use textual analysis when identifying short film clips for their experiment design, their quantitative procedures and techniques involve statistical models rather than a qualitative interpretation of the cinematic text and quantitative data sets. To film scholars, experiment design offers little to the analysis of film and is perceived as reductive rather than inductive (Smith, M. 2013; Creswell, 2003). This thesis took a mixed methods approach that is familiar from the field of human computer interaction (HCI) and brings together the methods, procedures and techniques from film studies, media psychology and psychophysiology. This is because HCI has repeatedly demonstrated that synthesising these opposing methodological approaches can be a powerful methodological tool in its own right, especially in designing experiments and capturing data sets that measure user/viewer narrative trajectories (Benford et al. 2009).

Taking on board the mixed methods approach, this in-depth study identified three data sets that represented the viewer's experience of suspense: psychophysiological recording (electrodermal activity), viewer verbal feedback comments and textual analysis. Psychophysiological recording is central to this thesis because it accurately measure viewers' involuntary responses to a stimulus, capturing microscopic physical changes within a viewers' body and offering an alternative and fruitful method for

interrogating and defining cinematic suspense. Electrodermal activity (EDA), which presents as electrical changes in the skin and emotional sweating, was selected as the most reliable psychophysiological recording technique to measure viewer anxiety responses. This is because the skin is the only bodily organ which can exclusively measure sympathetic neural activity, which when activated by a real or imagined threat triggers a strong anxiety response. Ideally I would have selected two invisible data channels to measure the viewer experience of suspense by combining EDA with eye tracking because viewer physiological responses (EDA) would have been synchronised with specific visual elements that viewers were looking at on screen (eye tracking). This would create a direct link to visual information and skin conductance responses (SCRs). However, capturing and analysing another complex data set would have been too demanding. The combination of EDA and eye tracking though would be seriously considered for future research.

In the 'Terror & Tension' film experiment 32 short films clips were extracted from 8 horror films, across 4 sub genres: supernatural, zombie, home invasion and science fiction. The film clip selection was based on Susan Smith's narrative model (vicarious, direct, shared and composite). Her suspense narrative model served three purposes: firstly, the narrative structures defined the duration of the film clip rather than selecting an arbitrary duration of 1.0-3.0 minutes used in most psychology experiment design (Rottenberg et al. 2007: 15). Secondly, it led to a new approach to using short film clip extraction from feature length films, in that each film clip had a defined generic narrative structure to elicit suspense. This meant that none of the film clips had to be manipulated to elicit suspense, a process often used to measure suspense using psychology experiment design (Mattenklott, 1996: 288-289; Friedrichsen, 1996: 339-340). Thirdly, to apply the EDA model of suspense to analyse Susan Smith's suspense narrative model through a series of case studies to explore how narrative structures and cinematic techniques construct suspense and shape viewer experience.

However, before an analysis of viewer EDA responses to the film clips in the 'Terror & Tension' experiment could be made the EDA data had to go through a rigorous data

treatment process. This led to identifying a relationship with fear stimuli (fear as a *phasic* emotion) presented in the film clips and the measurement of anxiety as a *phasic* emotion, in terms of two types of skin conductance responses (SCRs) rise time ranges. First, a traditional short SCR rise time range of 1.0-3.0 seconds (Boucsein, 2012; Dawson et al. 2009). Secondly, a rise time of 3.1-14.0 seconds which traditionally would be described as skin conductance level (SCL) (Boucsein, 2012), even though it was found in the film experiment SCRs which had a rise time within 3.1-14.0 had the same phases of traditional SCRs (latency, rise time, peak amplitude and recovery). With SCR rise time ranges being 1.0-3.0 and 3.1-14.0 seconds, representing a mediating anxiety response to fear stimuli in the film clips they were named as mediation peaks. To provide a distinction between the two mediation peak responses that were measuring an anxiety response to fear stimuli in the film clips they were named as 'Momentary Fear' (1.0-2.9 seconds) a condensed anxiety response and 'Extended Fear' (3.0-14.0 seconds) a prolonged anxiety response.

Anxiety intensity levels were defined by the normalisation of viewer EDA data sets to eliminate individual differences in SCR peak amplitude. This converted the measurement of SCR amplitude of Microsiemens into z-scores which provided a scale of anxiety intensity based on -1.0 – 1.0+ standard deviation. To simplify the anxiety intensity scale the standard deviation (-1.0 – 1.0+ scale) was converted into 4 different levels, each being a 0.5 standard deviation. These 4 levels represent anxiety intensity, level 1 (Extreme high), level 2 (high), level 3 (medium) and level 4 (low). Therefore the two mediation peaks, 'Momentary Fear' and 'Extended Fear' measured viewer anxiety durability and the standard deviation of the SCR amplitude provided the scale of anxiety intensity using 4 levels. This then formed the basis of an 'EDA framework' which could be applied to measure cinematic suspense in horror films and viewer anxiety responses.

Although the EDA model of suspense was underpinned by the theoretical definition of suspense (chapter 1) and psychophysiological framework (chapters 2 and 3) to gain additional evidence that it could accurately measure viewer experience of suspense the

EDA model of suspense was then tested. I used the descriptive statistic Pearson's coefficients of correlation (*P*) to determine the strength of a correlation between the two variables (expected rise time range and actual rise time ranges). This testing process provided statistical evidence that indicated it was possible to measure cinematic suspense in terms of viewer anxiety durability and intensity. The results of the testing procedure provide further evidence that the EDA model of suspense can accurately measure viewer experience of suspense and offers a valuable contribution to psychophysiology in determining a relationship between fear and anxiety as *phasic* emotions and by proving there is a relationship between the construction of suspense as an anxiety response and SCR rises time duration and amplitude. Furthermore, the model also detects the small clusters of mediation peaks that identify a small group of viewer anxiety responses during micro and short sequences of a film clip in terms of anxiety durability and intensity level. In short, the EDA model can identify the most suspenseful sequences of a film clip. Overall the EDA model of suspense recorded 1055 viewer mediation peak responses across all viewers and film clips, with 60% being 'Momentary Fear' and 40% being 'Extended Fear' responses. Additionally the EDA model of suspense also measured viewer anxiety responses through four levels of intensity. This demonstrates that viewer anxiety responses to fear stimuli in the film clips were accurately measured in terms of anxiety durability and intensity. Viewer feedback that was captured through verbal self-reports after each film clip also supports the findings of the EDA model of suspense, with 85.6% of viewer comments mentioning that they experienced some form of anxiety response ('tension', 'anxious', 'suspense' 'scared') to fear stimuli in the film clips.

Viewer physiological responses and feedback were then analysed alongside textual analysis of the film clips. This dataset determines psychophysiological suspense through two frameworks for understanding both viewer experiences, and the formal construction of suspense within horror films. The first demonstrates the value of skin conductance responses for detecting varying forms of anxiety, and rating the durability and intensity of those suspenseful moments in a viewer. The second builds upon film studies' theoretical understanding of suspense by analysing viewer responses

alongside deep textual analysis of seven case studies to determine exactly which forms of suspense are constructed by narrative and cinematic elements (e.g. cinematography, sound and mise-en-scène). Combining these three data sets leading with a qualitative approach to mean-making and knowledge claims formed a holistic approach to developing a theory about viewer experience of cinematic suspense. The discussion will now demonstrate how the EDA model of suspense and viewer feedback responses to the case studies provide a new understanding of cinematic suspense through two sections: controlling narrative information and empathetic connection with fictional characters.

Controlling Narrative Information

The findings from the EDA model of suspense and viewer feedback comments discovered that controlling narrative information and plot development in terms of what is shown and not shown to the viewer strongly influences suspense. When too much narrative information is concealed or revealed to the viewer suspense is diminished producing a weaker viewer anxiety response in terms of durability and intensity level. In some cases it stopped the elicitation of mediation peaks responses altogether. For example, *The Descent* shared suspense film clip discussed in chapter 4 illustrates how providing too much and too little narrative information during a fight sequence (28.0-38.0 seconds) between the zombie and protagonist diminished suspense. In the first case the zombie's identity is fully revealed during the fight sequence using long, medium, close up and extreme close up shots of the zombie. These camera shots assisted the viewer in becoming more familiar with the appearance of the zombie and make it less frightening. In the second case narrative information was missing during the fight sequence, where a rapid succession of jump cut edits were used to increase pace and heighten suspense. The combination of revealing the appearance of the zombie and the missing sections of narrative information between shots to increase the pace of the action and made it more difficult for viewers to understand the story, with many viewers mentioning that they were confused. According to David Bordwell when too much or too little narrative information is provided to the viewer story comprehension dissipates (Bordwell, 2013: 54). The participants' reaction to the succession of jump cuts resulted in feelings

of disorientation and confusion about what was happening during the sequence. This is because viewers had to work harder mentally to process the narrative information and make causal links between the camera shots. Although increasing the pace of the narrative using rapid jump cuts has been known to heighten suspense through interchanging scenes (Sijll Van, 2005) *The Descent* shared suspense film clip case study demonstrates that this is not always the case.

The *Silent House* direct suspense film clip, provides an example where too little narrative information diminishes suspense. In this instance only 13.6% of the duration of the film clip had visual narrative information. At first the film clip elicited a prolonged anxiety response for many viewers at a high level of intensity between 4.7-16.0 seconds of the film clip. However, this strong anxiety response pattern was not repeated during the remaining 21.0 seconds of the film clip. Viewers remarked that they could only make sense of the plot through aural elements pertaining to the protagonists whimpering cries and some background sounds. When we also consider that visual narrative information was limited to three still images and one moving image at the end of the film clip, which were only 0.44 seconds in duration, illustrates that the lack of visual storytelling had a big influence of the construction of suspense in the film clip. The type of stimulus being bright camera flashes followed by an image or moving imagery towards the end of the film clip, were used to scare the viewer to elicit an instinctive response. When we take into consideration that 86.4% of this film clip's duration is in total darkness and that brief visual information appears intermittently during the film clip, it suggests that suspense diminished over time because the viewer had to work harder mentally to make sense of the plot and story context.

The examples from *The Descent* shared suspense and *Silent House* direct suspense provide evidence that providing too little narrative information can diminish suspense and disrupt story comprehension when narrative information is presented too quickly or when visual narrative information is hardly present in the film clip. In particular the use of a rapid succession of jump cuts delete chunks of narrative information unlike continuity editing which provides the viewer with a continuous flow of

narrative information from one camera shot to another (Barsam, 2007: 262). This informs us that for suspense to occur their needs to be a balance of concealing and revealing narrative information or it will result in frustrating the viewer and diminish suspense. We shall now turn to a specific narrative structure, vicarious suspense, which achieves a balance between revealing and concealing narrative information within the same frame. The definition of vicarious suspense is that the viewer is privileged with narrative information about a fictional character's situation that they themselves are denied.

The findings that were garnered by the EDA model of suspense indicate that the vicarious suspense narrative structure has the potential to elicit a prolonged anxiety response at an extremely high level, more so than direct, shared and composite suspense (see chapter 3). The *Quarantine* vicarious suspense film clip provides the most robust example of eliciting the strongest form of suspense from the clips analysed here, despite the fact that Susan Smith suggests that composite suspense is more likely to do so (Smith, S. 2000: 24). *Quarantine* elicited 4 clusters of 'Extended Fear' level 1 responses and produced a prolonged anxiety response at an extremely high level of intensity. This was achieved through additional narrative elements that support the construction of a strong form of suspense by revealing and concealing narrative information within the same frame. First, a potential conflict between the zombie and protagonist is revealed to the viewer raising their concerns for her safety. Suspense heightens when the viewer watches the zombie moving closer to the protagonist and both are juxtaposed within the same frame but neither know each other's location and the zombie is not aware of the protagonist's presence. Secondly, the concealment of visual information concerning the inanimate metallic objects that are heard by both the viewer and the protagonist, activating the viewers concern for her safety and increasing the viewer's and apparently the protagonist's anxiety response in the sequence. Thirdly, delaying the revelation of the zombie's identity to the viewer until 14.0 seconds into the film clip creates additional tension.

Furthermore, the choreographed movements between the protagonist and zombie during the juxtaposed sequence are carefully managed and synchronised with each

other. As the zombie reaches out towards her she moves closer to the camera and away from the zombie, providing the viewer with an extreme close up of her facial expressions of fear. This process is reversed when the zombie draws his hand away from her and she moves away from the camera. During choreographed movements, extreme close ups reveal to the viewer that she is in a state of terror and the close spatial relationship between the zombie and protagonist, information she is denied, which increases both the protagonist's and the viewer's anxieties. Information about the protagonist's presence is also concealed from the zombie producing another strand of vicarious suspense. Both the antagonist and protagonist being denied information makes the scene more distressing for the viewer because the zombie is moving closer and could stumble across her at any moment and kill her.

Quarantine also uses lighting (revealing information) and darkness (concealing information) within the same frame to heighten suspense. For example, night-vision lighting is used to reveal the protagonist's situation and her facial expressions of fear. Based on elicited mediation peaks and viewer feedback responses this produced a strong form of suspense. This finding is particularly informative about plot development because it is argued by David Bordwell that suspense can only occur by concealing or delaying narrative information to the viewer, whereas lighting in this case demonstrates how revealing narrative information can also elicit a strong form of suspense. *Quarantine* also used darkness well to elicit a strong form of suspense by concealing or delaying narrative information from the viewer, the protagonist and the antagonist.

The *Grave Encounters 2* composite film clip from chapter 5 provides another example where the protagonist is juxtaposed with the antagonist within the same frame and eliciting a prolonged anxiety response. In this instance the protagonist is seen walking towards a supernatural force which is controlling the movements of a child's toy rocking horse within the same frame. Although this sequence produced a prolonged anxiety response as a high level of intensity the film sequence did not produce a prolonged anxiety response at an extremely high level of intensity as the above sequence in *Quarantine.* This is because the protagonist's face and facial expressions

of fear in *Grave Encounters* 2 film clip are concealed for the viewer. Whereas in *Quarantine* the protagonist's facial expressions of fear are shown throughout the sequence in close up and extreme close ups so viewers pick up on her emotion state which elicited a strong anxiety response.

Cases where suspense relied on repetition of narrative information to elicit suspense had mixed results. Turning to the previous example of two similar suspense sequences in the *Silent House* composite suspense film clip, both film sequences elicited strong but different types of anxiety response. In the *Sinister* composite suspense film clip, the repetitive pattern of acousmatic sounds: distorted voices singing a demonic chant combined with a non-diegetic sonic drone resonated with viewers as being threatening and elicited a stronger anxiety response when it was repeated during the film clip. Furthermore, the vocal sounds from the protagonist's scream with an upshift in pitch combined with the zombie's groans in the *Quarantine* vicarious suspense film clip were more successful in eliciting a stronger anxiety response when repeated compared to acousmatic inanimate object sounds (metallic sounds) even though the metallic sounds were louder and more directly threatening. However in the *Silent House* direct suspense film clip, the repetitive pattern of suspense created by using Polaroid camera flashes of bright light followed by still image intermittently during the film clip diminished suspense because 'Extended Fear' level 1-2 responses declined after 16.0 seconds into the film clips with 21.0seconds remaining of the film clip.

Empathetic Connection with Fictional Characters

Generating an empathetic connection between viewers and fictional characters proved successful in the *Quarantine* vicarious suspense film clip and the *Silent House* composite suspense film clip. The main reason being that in both film clips the protagonist's face was shown in close ups and extreme close ups, revealing to the viewer their emotional state through their facial expressions of terror. In these film clips both actors contributed to the development of an empathetic response from the viewer by convincing the viewer they were in a state of terror and feared for their safety. An empathetic response was also created through vocalised sounds from fictional characters in *Silent House* direct suspense and *Quarantine* vicarious

suspense. In the *Silent House* direct suspense film clip the protagonist produces a whimpering cry and in the *Quarantine* vicarious film clip she produces a very quiet scream. Both characters created an upshift in pitch and producing clusters of 'Extended Fear' level 1 and 2 responses in both film clips. This is supported by research into screams that have an upshift in pitch producing a strong response from people listening to them (Blumstein et al. 2012: 4), which was demonstrated by. Also in *Quarantine* the zombie's creepy groans increased in volume as he moved closer to the protagonist eliciting a cluster of 'Extended Fear' level 1 producing a prolonged form of anxiety at an extremely high level of intensity.

Barriers to developing an empathetic response with the protagonist were demonstrated when there were no sustained close ups or extreme close ups of the protagonist face, denying the viewer what the protagonist was feeling. The *Grave Encounters 2* direct suspense film clip, provides an example of how an empathetic response for the protagonist was less likely when the viewer had the protagonist point-of-view through a hand held camera. which made them feel like they were part of the story world, a process described by Ed Tan as imagined self-empathy (Tan. S, 1998) and/or narrative transportation (Green. C & Brook. C, 2000: 701). These viewers responded with a mixture of Extended Fear level 1-3 responses indicating that imagined self-empathy is more likely to elicit a prolonged anxiety response rather than a condensed one.

These case study examples and the key factors that shape suspense that they reveal demonstrate how the EDA model of suspense supported by viewer comments provides a new method of film analysis which can identify specific narrative and cinematic techniques can elicit either a strong or weak form of suspense, depending on the balance of narrative information being revealed, concealed or delayed to the viewer or fictional characters. In particular, a strong form of suspense was elicited when narrative information was revealed to the viewer when assisting in the development of a viewer empathetic response with the protagonist(s). Taking a mixed methods approach, combining three forms of data: film textual analysis, viewer's physiological responses and viewer's feedback themes and individual comments not only further

validates the EDA model of suspense but also provides a valuable contribution to film analysis techniques in film studies and media psychology.

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