

A Consilient Approach to Horror Video Games

Challenges and Opportunities

Mathias Clasen

*is assistant professor in literature and media at the School of Communication and Culture, Aarhus University. His research is mainly concerned with the interdisciplinary study of frightening entertainment. He is associate editor of *Evolutionary Studies in Imaginative Culture*.*

Jens Kjeldgaard-Christiansen *is graduate student at the School of Communication and Culture, Aarhus University. His research covers the agonistic structure of popular culture and its adaptive roots. He has published on the psychology of pop-cultural villains in *Evolutionary Behavioral Sciences*.*

Abstract

In response to the crisis in the humanities, some scholars have proposed consilience as a solution. They argue that humanists should build on recent findings in the sciences of mind, including cognitive and evolutionary psychology. We discuss the benefits and pitfalls of such an approach, illustrating our discussion with an analysis of the horror video game *Amnesia: The Dark Descent*. We argue that recent theoretical and empirical developments in the evolutionary social sciences can make sense of how and why horror games so effectively foster immersion and predictable psychophysiological responses. They target evolved survival mechanisms and are structured to reward vigilance and persistence in the face of fear- and anxiety-provoking stimuli. Finally, we discuss and refute a number of common criticisms of the consilient approach.

Keywords media psychology, game studies, consilience, horror, evolutionary psychology

Introduction

By their own admission, the humanities are in trouble. Interest is dwindling in- and outside academia, funding is decreasing, employment prospects are poor (Gottschall 2008; Delany 2013; Lewin 2013). The crisis has many causes, but when the public intellectual E.O. Wilson addressed the problem in *Consilience* (1998), he identified at its crux an epistemic rift between the humanities and the sciences. The lack of fruitful dialogue between the “two cultures” (Snow 2012) resulted for the humanities in epistemic isolation; they were left behind, unable or unwilling to explore the implications of the 20th century’s major scientific advances. Wilson argued that this unhappy development reached an apogee with the emergence of poststructuralism in the 1970s. Declaring that human inquiry could never transcend the indeterminate nature of the sign, the poststructuralists went on a campaign of radical antifoundationalism. There was no valid way, they held, of choosing between competing hypotheses, especially not in human affairs. The ensuing intellectual climate has sustained scientifically outmoded explanatory paradigms such as orthodox psychoanalysis and later reconstructions of Freudian theory. How could humanistic scholars make new and exciting discoveries when working from this intellectual impasse? In giving up truth, poststructuralism also gave up scientific relevance.

We agree with Wilson that this is a major problem. We agree also with his solution. Humanistic scholarship may be concerned with the idiosyncrasies of a particular species, but it does not follow that the enterprise should be itself equally idiosyncratic. The humanities will benefit from adopting as a methodological touchstone the basic tenet of consilience: reality forms a unified, hierarchical causal order (Carroll, McAdams, and Wilson 2016). The laws of biology obey, but do not reduce to chemistry; the laws of chemistry obey, but do not reduce to physics. From this uncontroversial epistemology fractionates a useful heuristic: the human sciences should constrain, but not determine how we approach art (Gottschall 2003). A consilient approach, then, is uniquely equipped to shed light on the form and function of cultural artifacts. It counteracts the anti-scientific ethos of dominant poststructuralist paradigms, which has contributed significantly to the crisis and perceived irrelevance of the humanities.

The poststructuralist dominance has not gone unchallenged, and many have done so from a Wilsonian position (Boyd 2009; Carroll 2013; Gottschall 2008; Pinker 2002). An increasing number of “bio-cultural” scholars absorb the major theoretical and empirical breakthroughs in, especially, the evolutionary social sciences (Carroll et al. 2015). They argue that the humanities stand to reclaim lost relevance and prestige if they reconnect to the knowns of the human condition. Such an aspiration will neither erode the purpose of the humanities, nor turn their rich and time-honored disciplines into the handmaidens of science; the cultural-historical complexity of humanistic subject matter will continue to necessitate traditional approaches in an integrated paradigm (Boyd, Gottschall, and Carroll 2010; Carroll 2013; Rainsford 2007). What will have to give is the theoretical free-for-all that allows humanistic scholars to make frankly silly pronouncements about, for instance, the topic of the present article: horrific entertainment. Psychoanalytical horror study (Dumas 2014; Schneider 2004), for example, proceeds from unscientific premises (Kihlstrom 2009) that profoundly distort its subject matter. Thus, Barbara Creed (1996) manages to conceptualize wildly divergent film scares as different expressions of an abstract “monstrous feminine,” a metaphorical image of the “castrating female” that metaphorically threatens the integrity of the male body. There are at least two problems with this interpretation. First, there is no evidence that humans are—or indeed have reason to be—possessed of such a phobia. Second, Creed’s metaphorical castrator molds itself to any possible audiovisual configuration. It is an empty concept turned empty explanation. If horror studies is to make real progress, then horror scholars must abandon antiquated theories and stretchy metaphors. They must locate the field within a consilient research paradigm (Clasen 2012; Clasen 2016).

In this article we illustrate the consilient approach by analyzing the popular survival-horror video game *Amnesia: The Dark Descent* (Frictional Games 2010), thus demonstrating the explanatory power of a vertically integrated framework. We focus on *Amnesia* because it stands as an exemplar of the subgenre, a crystallization of the elements that characterize this type of video game (Tosca 2014). The game exploits narrative, ludic, and modal devices that together target the human psychophysiological danger-management system, rewarding player vigilance and persistence in the process.

The analysis serves as an implicit argument for its assumptions: only by measuring our conclusions against the scientific evidence can we ensure integration and validity.

Amnesia: The Dark Descent

Amnesia is set in a haunting vision of 19th-century Prussia. The player assumes the role of the amnesic protagonist, Daniel, who inexplicably wakes up in the dark, dilapidated Castle Brennenburg. Daniel quickly discovers a note, seemingly of his own making, explaining to him that he has erased his own memory, and that he must now venture into the Inner Sanctum of the castle to kill the evil baron Alexander. This will bring redemption to him and his pre-amnesic self. It is also revealed that a “shadow” is stalking Daniel, and that it can only be evaded, not stopped. So informed, Daniel begins his descent.



Fig. 1. The dark and disturbing interior of *Amnesia's* Castle Brennenburg.

The independent game was an across-the-board success. It has sold more than one million copies (Grip 2012) and prompted thousands of YouTube videos featuring players responding to it with vocal terror. The prominent gaming website IGN.com called it “one of the

scariest games in recent memory” and added with approval that few other video games “are able to conjure up an atmosphere this genuinely frightening” (Onyett 2010). *Amnesia* belongs to a subgenre of horror video games called survival horror. This subgenre, the digital history of which stretches back to the early 1980s, lets the player control a more or less defenseless avatar in a game-world brimming with danger (Perron 2009). The primary objective of such games is to survive these dangers. *Amnesia* thrusts players into a dark, threatening, and unpredictable virtual environment and is structured around a single-minded affective ambition: to terrify. It uses a fairly narrow range of formal devices to achieve that ambition. What, then, makes the game so effective? And why do so many people willingly seek out that kind of experience? It is in answering such questions of ultimate causation that the consilient approach shows its value.

Amnesia is effective as a horror game because it imaginatively transports the player into a virtual environment teeming with stimuli that meet the input criteria of an evolutionarily conserved defense mechanism hardwired into the human nervous system. That mechanism – the “fear module” (Öhman and Mineka 2001) – has evolved over millions of years in response to threats to our ancestors’ fitness, and its design specifications reflect its evolutionary lineage. The human fear module is preferentially attentive to evolutionarily relevant stimuli such as reptiles, spiders, and hostile conspecifics (LoBue 2013; Marks and Nesse 1994; Seligman 1971), which explains why horror monsters reflect ancestral dangers rather than modern ones such as power tools and trans fats (Clasen 2012). Moreover, the operation of the module is characterized by automaticity, hyper-reactivity, and cognitive encapsulation (Öhman and Mineka 2001). This explains why humans tend to jump at shadows – in potentially life-threatening situations, a false positive is preferable to a false negative (Atran and Norenzayan 2004; Haselton and Buss 2000) – and find it difficult to consciously extinguish the physiological response to such a false alarm. Mediated horror, including horror video games, has developed to take advantage of these design characteristics.

Amnesia uses a first-person optical point-of-view to foster player immersion (Krzywinska 2002; McMahan 2003) (fig. 2). This enables the player to imaginatively enter the game themselves. As the game

designers put it, “one of the main goals was for the player to become the protagonist” (Grip 2010). Visual and auditory cues scaffold this mechanism of imaginative transportation. Whenever Daniel encounters disturbing scenes (such as a tableau of decomposing corpses or a monster in the distance), the avatar’s response anticipates and mirrors the player’s intended response: the game emits sonic representations of an accelerating heart, quickened breathing, and anxious whimpering. Moreover, the visual field is distorted in a representation of fear-triggered perceptual changes (fig. 3). These audio-visual cues are designed to intensify the player’s emotional response, in a manner parallel to the use of reaction shots in horror film. Finally, the player interacts with the virtual environment via the avatar. The player’s actions thus determine the outcome of the game, within scripted parameters set by the programming. A quick flick of the mouse can mean the difference between life (the avatar lives and the game goes on) and death (the avatar dies and the player is forced to replay that section of the game). This illustrates the advantage of horror in video games over horror in other media: interactivity prompts the player to invest emotionally in the unfolding narrative, which further enhances immersion (Lynch and Martins 2015; Rouse III 2009).



Fig. 2. *Amnesia*’s first-person perspective fosters immersion.

The virtual environment of *Amnesia* features a concentration of stimuli that reflect the structure of the human fear module rather than the structure of the player's empirical world. Seldom do we find ourselves alone in the dark, lost and hunted by predatory forces of evil while teetering on the edge of insanity. Yet this premise resonates powerfully with evolved dispositions. Humans are relatively weak and defenseless; what we lack in the way of muscle, claws, and fangs, we make up for in our ability to imaginatively forecast and plan for worst-case scenarios, as well as our unparalleled capacities for social cognition and cooperation (Gazzaniga 2008; Tomasello et al. 2005). The flip-side of our hyper-social nature is the anxiety that can attend involuntary isolation. Isolation leaves us vulnerable to predation and assault. We evolved to feel anxiety in response to isolation because this negative emotion motivates us to seek others for protection and comfort (Cacioppo and Patrick 2008). The only prospect worse than being alone is being alone in dark and unpredictable surroundings, prey to powerful and malicious agents. This is the evolutionarily salient nightmare scenario brought to life in *Amnesia* and intensified by the vulnerability imposed on the player. The game-world affords the player no weapons and no way of engaging its monsters in combat.

Amnesia's celebrated insanity mechanic is designed to increase the player's sense of vulnerability and to motivate defensive and exploratory in-game behavior. When the avatar is exposed to darkness for too long, the player experiences a lack of control and distortion of the visual field (fig. 3). This impairs the player's ability to escape the monsters. The use of light sources counteracts avatar insanity and restores full control, but has the side effect of attracting monster attention. It is a catch-22. Humans have poor night-vision, and darkness sets our fear module on edge because a loss of visual information makes us much more vulnerable to predation (Grillon and Davis 1997; Li et al. 2015). In *Amnesia*, however, the use of light sources to counteract the anxiety produced by darkness makes death by predation even more likely.

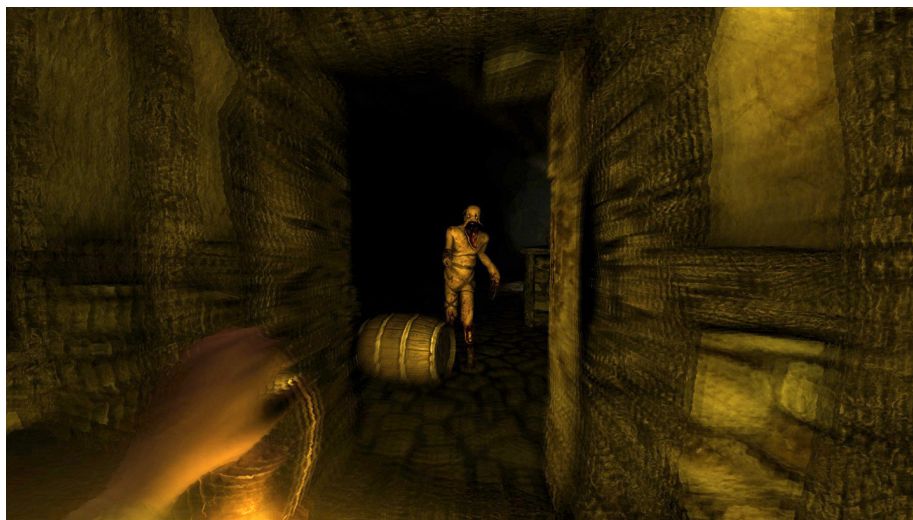


Fig. 3. The player suffers perceptual disturbances and monster attack.

The predatory monsters have vaguely distorted human-like morphology, malicious agency, and are equipped with means of predation, including a very large, fanged mouth and what appear to be claws. The odds of meeting such organisms in real life are slim to none, but the monsters are calibrated to meet the input specifications of the human fear module, which evolved to be sensitive to predator cues (Barrett 2005). *Amnesia's* predators, however, are more horrifying than their real-world counterparts, such as big cats or hostile conspecifics. They are supernormal monsters, imaginary beings worse than anything nature ever produced, and thus more effective in generating a negative emotional response (Barrett 2010).

Amnesia also uses ambiguous cues of agency to prime the fear module, in particular the adaptive tendency of the module to overshoot given the slightest cue of danger. This aspect of the module, dubbed "hyperactive agency detection" (Barrett 2004), evolved to protect our ancestors from harm by camouflaged ambush predators. Early in the game the player sees doors blowing open, swinging chandeliers, and books falling from a bookcase. These events suggest agency, but that agency is withheld from the player. The result is a defensive anxiety response (Öhman 2008), one that keeps players on edge. The game designers' strategy of informing players that they are "stalked" by a "shadow," and then withholding that shadow from view during the first hour or so of gameplay

while exposing players to ambiguous cues of agency, is yet another example of how the game exploits evolved dispositions to engage players and provoke in them a negative emotional response.

Amnesia, then, is well designed to exploit the structure of the evolved and adaptive human fear module. The game rewards vigilance (only by paying close attention to affordances in the virtual environment can the player complete the game) and persistence in the face of game-induced negative affect (only by trial-and-error can the player build the expertise needed to avoid predators and solve the puzzles that halt story progression). Why do players expose themselves to a virtual experience predominantly structured around negative affect? We argue that horror in whatever medium satisfies an evolved desire for simulated experience (Clasen 2012; Steen and Owens 2001). Horror video games are particularly good at fostering immersion compared to horror in other media; in effective survival-horror video games, the player and the avatar melt together, producing a strong sense of immersion and thus strong emotional engagement (Rouse III 2009). They offer consumers intense emotional stimulation in a context known to be safe, and thus represent vectors to vicarious experience with levels of negative emotion not safely come by in real life.

Making sense of the effects, appeals, and functions of horror requires an understanding of the psychological underpinnings of the genre, including those aspects of the human fear module that at first glance appear irrational. Indeed, the cross-cultural penchant for horrifying entertainment is a puzzle for those who view humans as rational agents. The Freudians avoided that mistake by viewing humans as profoundly irrational, but committed another by positing chimerical mechanisms at the roots of human irrationality and horror liking. Consilience offers a corrective to that mistake. By building on and incorporating the latest, most robust research on human behavior, cognition, and emotion, a vertically integrated approach offers an adequate, up-to-date explanation of the peculiar appeals and workings of horror.

Challenges to the Consilient Approach

The consilient approach loads on both opportunities and challenges. We have proposed that the opportunities tilt the balance clearly in its favor, not least in the potential of consilience to restore epistemic

relevance to humanities scholarship (Carroll et al. 2015; Slingerland and Collard 2012). By bringing this scholarship into line with convergent findings from the human sciences, scholars in the humanities will be better equipped to contribute to integrative research on the human condition. In this section we address a number of oft-cited or -implied counterpoints to that view.

First is the epistemological angle. Some critics hold that the humanities represent a ‘different way of knowing,’ a realm of deeper insight sectioned off from the organon of science (Dupré 1993). The history of this lazy argument, as Wilson (1998) and others point out, is one of repeat failure. In the 19th century, for example, the vitalists anointed biological life an epistemic insuperable. In the 20th century, the goal post had moved to the human mind. Modern cognitive science is now prying at it from all sides, mapping its neural substrate and uncovering its astounding range of quirks and biases. Consilient humanistic scholarship, no more discouraged, has shed light on the forms and functions of art (Boyd 2009; Carroll 2013; Clasen 2012; Dutton 2009; Jonsson 2013; Kjeldgaard-Christiansen 2015). In the process it is showing an interlocking of cause and effect across disciplinary boundaries.

Others have argued that hermeneutic scholarship is so inherently complex as to be a bridge too far for the consilient approach (Goodheart 2007). This line of argument is demonstrably false. Humanistic scholars habitually make claims about what humans are like, and why. These are at least potentially scientific claims, examples of which feature in preceding sections of this article. The objection also seems confused when viewed from the perspective of the sciences. As the psychologist Steven Pinker points out, “the real medium of artists, whatever their genre, is human mental representations” (2002, 414). Mental representations – their reception, processing, and behavioral consequences – index psychological disciplines. The social sciences also explore the contents of such representations, including human interests, preferences, and concerns. Seeking to integrate between the two cultures, consilient humanistic scholarship is now assimilating the empirical methods of science and employing them to illuminate our shared imaginative investments (Carroll et al. 2015). Competent inquiry into human experience is indeed a complex and challenging undertaking, but it is neither for the humanities nor for the sciences a disarming one.

A lesson salvageable from the complexity argument is that the merits of consilience in the abstract cannot offset methodological imprudence. Consilient analysis connects disciplines in an order of increasing complexity that specifies potential explanatory ties (Carroll, McAdams, and Wilson 2016; Wilson 1998). For example, behavioral biology can inform evolutionary psychology, and evolutionary psychology can inform media interpretation—this was the assumption of our game analysis. But as investigators' theoretical starting point and area of application diverge in terms of ontic complexity, their ties begin to fall out of focus. This is not a lofty epistemological argument; it is the working assumption of the scientific enterprise. Thus, we do not try to explain why humans like sex (or horror) in terms of particle physics. We engage the problem at proximate levels, including those of evolutionary biology and cultural anthropology. The implication is that consilient humanistic scholarship must be eclectically prudent, and this entails basic literacy with candidate disciplines. These, naturally, center on the sciences of mind.

Finally, Geoffrey Harpham, former President and Director of the American National Humanities Center, has recently argued that disciplinary collapse, purportedly the aim of Wilsonian consilience, would compromise spaces of creative edification within and between disciplines (2015). He rightly notes that the formal disciplines represent "concessions to human finitude" (236) and hence a kind of bounded optimum. The answer to this charge is that no one, including Wilson and the authors of the present article, is proposing to collapse the disciplines. We are puzzled as to the referent of this radical position. However, the interdisciplinary forays allowed and lauded by Harpham (236) – and argued for by us – are only possible insofar as disciplinary borders are permeable in the academic praxis. They very often are not, especially for young and untenured researchers, and this is the real threat to scholarly creativity (Carroll 2010). Therefore, while we agree with what Harpham has to say for the value of the humanities qua humanities, we submit that his position is compatible with a consilient research paradigm, properly understood.

Conclusion

In this article we have argued for consilience as at least a partial solution to the crisis of the humanities. We illustrated the consilient approach with a short analysis of the horror video game *Amnesia: The Dark Descent*. Referencing especially the evolutionary social sciences, we showed that *Amnesia* is structured to target the evolved human fear module, thus eliciting predictable psychological responses and attendant behaviors. We also showed how a consilient approach to horror video games dissolves the paradox of horror by positing an adaptive function for imaginative artifacts designed to instill negative emotion in their audience. Humans evolved to find pleasure in vicarious experience with threatening scenarios. We concluded the article with a defense of consilience against its detractors. The consilient approach does not, contra their charges, run afoul of the complexly cultural subject matter of the humanities. Rather, it specifies promising, integrative perspectives on it. Many subjects in the humanities remain uncharted territory to consilient scholarship, and we are eagerly anticipating future exploration of these domains.

References

- Atran, Scott, and Ara Norenzayan. 2004. "Religion's Evolutionary Landscape: Counterintuition, Commitment, Compassion, Communion." *Behavioral and Brain Sciences*, 27 (6): 713-30. doi:10.1017/S0140525X04230175.
- Barrett, H. Clark. 2005. "Adaptations to Predators and Prey." In *The Handbook of Evolutionary Psychology*, edited by David M. Buss, 200-223. Hoboken, NJ: John Wiley & Sons Inc.
- Barrett, Deirdre. 2010. *Supernormal Stimuli: How Primal Urges Overran Their Evolutionary Purpose*. New York: W.W. Norton & Co.
- Barrett, Justin L. 2004. *Why Would Anyone Believe in God?* Walnut Creek, CA: AltaMira Press.
- Boyd, Brian. 2009. *On the Origin of Stories: Evolution, Cognition, and Fiction*. Cambridge: The Belknap Press of Harvard University Press.
- Boyd, Brian, Jonathan Gottschall, and Joseph Carroll, eds. 2010. *Evolution, Literature, and Film: A Reader*. New York: Columbia University Press.

- Cacioppo, John T. and William Patrick. 2008. *Loneliness: Human Nature and the Need for Social Connection*. New York: Norton.
- Carroll, Joseph. 2010. "Three scenarios for literary Darwinism." *New Literary History* 41: 53–67. doi:10.1353/nlh.0.0144.
- . 2013. *Reading Human Nature: Literary Darwinism in Theory and Practice*. Albany: SUNY Press.
- Carroll, Joseph, Dan P. McAdams, and Edward O. Wilson, eds. *Darwin's Bridge: Uniting the Humanities and Sciences*. New York, NY: Oxford University Press.
- Carroll, Joseph, Mathias Clasen, Emelie Jonsson, Alexandra R. Kratschmer, Luseadra McKerracher, Felix Riede, Jens-Christian Svenning, and Peter Kjærgaard. C. 2015. "Biocultural Theory: The Current State of Knowledge." *Evolutionary Behavioral Sciences*. Online first. doi:10.1037/ebs0000058.
- Clasen, Mathias. 2012. "Monsters Evolve: A Biocultural Approach to Horror Stories." *Review of General Psychology* 16 (2): 222-229. doi:10.1037/a0027918.
- Clasen, Mathias. 2016. "Terrifying Monsters, Malevolent Ghosts, and Evolved Danger-Management Architecture: A Consilient Approach to Horror Fiction." In *Darwin's Bridge: Uniting the Humanities and Sciences*, edited by Joseph Carroll, Dan P. McAdams, and Edward O. Wilson, 183-193. New York, NY: Oxford University Press.
- Creed, Barbara. 1996. "Horror and the Monstrous-Feminine." In *The Dread of Difference: Gender and the Horror Film*, edited by Barry K. Grant, 35-65. Austin, TX: University of Texas Press.
- Delany, Ella. 2013. "Humanities Studies Under Strain Around the Globe." *The New York Times*. Accessed January 15, 2016. http://www.nytimes.com/2013/12/02/us/humanities-studies-under-strain-around-the-globe.html?_r=0.
- Dupré, John. 1993. *The Disorder of Things: Metaphysical Foundations of the Disunity of Science*. Cambridge, MA: Harvard University Press.
- Dumas, Chris. 2014. "Horror and Psychoanalysis: A Primer." In *A Companion to the Horror Film*, edited by Harry M. Benshoff, 22-37. Malden, MA: John Wiley & Sons, Inc.
- Dutton, Dennis. 2009. *The Art Instinct: Beauty, Pleasure, and Human Evolution*. New York, NY: Bloomsbury Press.

- Frictional Games. 2010. *Amnesia: The Dark Descent*. PC. Helsingborg: Frictional Games.
- Gazzaniga, Michael S. 2008. *Human: The Science Behind What Makes Us Unique*. New York: Ecco.
- Goodheart, Eugene. 2007. *Darwinian Misadventures in the Humanities*. New Brunswick and London: Transaction Publishers.
- Gottschall, Jonathan. 2003. "The Tree of Knowledge and Darwinian Literary Study." *Philosophy and Literature* 27 (2): 255-268. doi:10.1353/phl.2003.0047.
- Gottschall, Jonathan. 2008. *Literature, Science, and a New Humanities*. New York: Palgrave Macmillan.
- Grillon, Christian, and Michael Davis. 1997. "Fear-Potentiated Startle Conditioning in Humans: Explicit and Contextual Cue Conditioning Following Paired Versus Unpaired Training." *Psychophysiology* 34 (4): 451-458. <http://www.ncbi.nlm.nih.gov/pubmed/9260498>.
- Grip, Thomas. 2010. "How the Player Becomes the Protagonist." In *The Games of Madness*, November 22. Accessed January 17, 2016. <http://frictionalgames.blogspot.com/2010/11/how-player-becomes-protagonist.html>.
- . 2012. "Amnesia – Two Years Later." In *The Games of Madness*, September 10. Accessed January 17, 2016. <http://frictional-games.blogspot.dk/2012/09/amnesia-two-years-later.html>.
- Harpham, Geoffrey G. 2015. "Defending Disciplines in an Interdisciplinary Age." *College Literature* 42 (2): 221-240. doi:10.1353/lit.2015.0018.
- Haselton, Martie G., and David M. Buss. 2000. "Error Management Theory: A New Perspective on Biases in Cross-Sex Mind Reading." *Journal of Personality and Social Psychology* 78 (1): 81-91. <http://www.ncbi.nlm.nih.gov/pubmed/10653507>.
- Jonsson, Emelie. 2013. "The Human Species and the Good Gripping Dreams of H. G. Wells." *Style* 47 (3): 295-314. <https://www.questia.com/library/journal/1G1-354858554/the-human-species-and-the-good-gripping-dreams-of>.
- Kihlstrom, John F. 2009. "Freud is a Dead Weight on Psychology." In *Atkinson & Hilgard's Introduction to Psychology* (15th ed.), edited by Susan Nolen-Hoeksema, Barbara L. Fredrickson, Geoff R. Loftus and Willem A. Wagenaar, 497. Hampshire, UK: Cengage Learning EMEA.

- Kjeldgaard-Christiansen, Jens. 2015. "Evil Origins: A Darwinian Genealogy of the Popcultural Villain." *Evolutionary Behavioral Sciences* 10 (2): 109-122. doi:10.1037/ebs0000057.
- Krzywinska, Tanya. 2002. "Hands-On Horror." In *ScreenPlay: Cinema/videogames/interfaces*, edited by Geoff King and Tanya Krzywinska, 206-223. London: Wallflower. pp. 206-223.
- Lewin, Tamar. 2013. "As Interest Fades in the Humanities, Colleges Worry." *The New York Times*. Accessed May 26, 2016. <http://www.nytimes.com/2013/10/31/education/as-interest-fades-in-the-humanities-colleges-worry.html?pagewanted=2&r=0>.
- Li, Yadan, Wenjuan Ma, Qin Kang, Lei Qiao, Dandan Tang, Jiang Qiu, Qinglin Zhang, and Hong Li. 2015. "Night or Darkness, Which Intensifies the Feeling of Fear?" *International Journal of Psychophysiology* 47 (1): 46-57. doi:10.1016/j.ijpsycho.2015.04.021.
- LoBue, Vanessa. 2013. "What Are We So Afraid of? How Early Attention Shapes Our Most Common Fears." *Child Development Perspectives* 7 (1): 38-42. doi:10.1111/cdep.12012.
- Lynch, Teresa, and Nicole Martins. 2015. "Nothing to Fear? An Analysis of College Students' Fear Experiences with Video Games." *Journal of Broadcasting & Electronic Media* 59 (2): 298-317. doi:10.1080/08838151.2015.1029128.
- Marks, Isaac M., and Randolph M. Nesse. 1994. "Fear and Fitness: An Evolutionary Analysis of Anxiety Disorders." *Ethology and Sociobiology* 15 (5-6): 247-261. doi:10.1016/0162-3095(94)90002-7.
- McMahan, Alison. 2003. "Immersion, Engagement, and Presence: A Method for Analyzing 3-D Video Games." In *The Video Game Theory Reader*, edited by Mark J. P. Wolf and Bernard Perron, 67-87. New York: Routledge.
- Pinker, Steven. 2002. *The Blank Slate: The Modern Denial of Human Nature*. London: Penguin Books.
- Onyett, Charles. 2010. "Amnesia: The Dark Descent Review." *IGN*. Accessed January 18, 2016. <http://www.ign.com/articles/2010/09/03/amnesia-the-dark-descent-review>.
- Perron, Bernard, ed. 2009. *Horror Video Games: Essays on the Fusion of Fear and Play*. Jefferson, N.C.: McFarland & Co.
- Rainsford, Dominic. 2007. "The Bright Light of Science and the Dim Truth of Art." *European Journal of English Studies* 11 (3): 285-300. doi:10.1080/13825570701409599.

- Rouse III, Richard. 2009. "Match Made in Hell: The Inevitable Success of the Horror Genre in Video Games." In *Horror Video Games: Essays on the Fusion of Fear and Play*, edited by Bernard Perron, 15-25. Jefferson, N.C.: McFarland & Co.
- Schneider, Steven J., ed. 2004. *Horror Film and Psychoanalysis: Freud's Worst Nightmare*. New York: Cambridge University Press.
- Seligman, Martin. 1971. "Phobias and Preparedness." *Behavior Therapy* 2: 307-321. doi:10.1016/S0005-7894(71)80064-3.
- Slingerland, Edward, and Mark Collard, eds. 2012. *Creating Consilience: Integrating the Sciences and the Humanities*. New York: Oxford University Press.
- Snow, Charles P. 2012. *The Two Cultures* (Reissue edition). Cambridge: Cambridge University Press.
- Steen, Francis F., and Stephanie A. Owens. 2001. "Evolution's Pedagogy: An Adaptationist Model of Pretense and Entertainment." *Journal of Cognition and Culture* 1 (4): 289-321. doi:10.1163/156853701753678305.
- Tomasello, Michael, Malinda Carpenter, Josep Call, Tanya Behne, and Henrike Moll. 2005. "Understanding and Sharing Intentions: The Origins of Cultural Cognition." *Behavioral and Brain Sciences* 28 (5): 675-691. doi:10.1017/S0140525X05000129.
- Tosca, Susana. 2014. "Amnesia: The Dark Descent: The Player's Very Own Purgatory." In *Analyzing Digital Fiction*, edited by Alice Bell, Astrid Ennslin, and Hans K. Rustad, 109-123. London: Routledge.
- Wilson, Edward O. 1998. *Consilience: The Unity of Knowledge*. New York: Knopf.
- Öhman, Arne. 2008. "Fear and Anxiety: Overlaps and Dissociations." In *Handbook of Emotions* (3rd ed.), edited by Michael Lewis, Jeanette M. Haviland-Jones, and Lisa F. Barrett, 709-729. New York: Guilford Press.
- Öhman, Arne, and Susan Mineka. 2001. "Fears, Phobias, and Preparedness: Toward an Evolved Module of Fear and Fear Learning." *Psychological Review* 108 (3): 483-522. doi:10.1037//0033-295X.108.3.483.