

# Presence and Heuristic Cues: Cognitive Approaches to Persuasion in Games

**Peter Christiansen**

University of Utah  
INSCC 266 | 155 South 1452 East  
Salt Lake City UT 84112  
(801) 318-2176  
Peter.Christiansen@utah.edu

## ABSTRACT

Just as rhetorical arguments can be embedded within the structure of a game's logic, so too can heuristic cues. In this paper, I argue for persuasive game design based upon using the technological affordances of videogames as a medium to trigger specific heuristic cues, thereby allowing game designers to create games that are able to evoke the necessary amount of systematic cognitive processing to promote long-term attitude change among players of the game. This approach is based upon the Heuristic-Systematic Model (HSM) of cognition, as well as the MAIN (Modality, Agency, Interactivity, and Navigability) model of technological effects.

## Keywords

Persuasive games, presence, heuristic cues, heuristic-systematic model

## INTRODUCTION

Videogames are typically thought of primarily as a medium of entertainment, more so than older media such as film and books, and even more so than other “new” media such as websites or smart phones. Nevertheless, videogames can and always have been used as tools of expression, instruction and persuasion. These can take the form of big-budget productions like *America's Army*, a first-person shooter developed for the U.S. Army as a recruiting tool (U.S. Army, 2002), or short web-based games like *dys4ia*, an autobiographical game by Aunte Pixelaunte about the experience of hormone replacement therapy (Auntie Pixelaunte, 2012). Among these intentionally persuasive games, perhaps the most common are “advergames,” or games developed specifically for the purpose of advertising.

Although advergames and other persuasive games are perhaps more common than ever before, there is still a great deal of debate about their effectiveness (see Hespos, 2011; Story, 2009; Waugh, 2005). Discussions of advergame design often revolve around attempts to analyze return-on-investment (ROI) and other metrics that are easily obtained with digital media. While such metrics can determine the effectiveness of a game-based campaign, they provide little explanation of why a game was effective or ineffective at achieving attitude change. Advergame designers may attempt to draw comparisons to existing games (Bogost, 2007, p. 103) or to campaigns in other media (Radd, 2007), but such approaches offer only vague direction to a project, rather than specific guidelines,

Proceedings of DiGRA 2014: <Verb that ends in 'ing'> the <noun> of Game <plural noun>.

© 2014 Authors & Digital Games Research Association DiGRA. Personal and educational classroom use of this paper is allowed, commercial use requires specific permission from the author.

and often fail to utilize the most significant attributes of videogames that distinguish them from more traditional media.

In this paper, I advocate for persuasive game design based upon using the technological affordances of videogames as a medium to trigger specific heuristic cues, thereby allowing game designers to create games that are able to evoke the necessary amount of systematic cognitive processing to promote long-term attitude change among players of the game. This approach is based upon the Heuristic-Systematic Model (HSM) of cognition, as well as the MAIN (Modality, Agency, Interactivity, and Navigability) model of technological effects. This approach uses specific heuristic cues, as identified in the MAIN model, to evoke the perception of presence, which in turn has been shown to increase message processing, leading to increased long-term attitude change.

## **THE HEURISTIC-SYSTEMATIC MODEL**

The Heuristic-Systematic Model (HSM) is a means of describing the underlying mental processes that take place when persuasive messages are processed. It is based upon the understanding that humans do not possess infinite capacity for cognition, and therefore must prioritize what kinds of information are given the most mental attention. Rather, humans tend to be “cognitive misers,” expending the minimal amount of cognitive resources necessary in order to make decisions (Sundar, 2008, p. 77). People are assumed to work toward holding “accurate attitudes,” or attitudes that are “perceived to be congruent with relevant facts” (Chaiken, Liberman & Eagly, 1989, p. 214). In other words, people will only expend cognitive resources when they perceive it to be necessary to forming accurate attitudes. This minimum level of cognition, also referred to as a “sufficiency threshold” (p. 220-221) must be attained in order for a person to be confident in the accuracy of her attitude. If one mode of processing does not reach this threshold, a more cognitive intensive mode of processing will be employed.

The HSM is based upon an earlier cognitive model, known as the Elaboration Likelihood Model (ELM). Like the HSM, the ELM is a dual-process model of cognition. (Petty & Cacioppo, 1986, p. 125-126). Therefore, it supposes that the processing of persuasive messages occurs along two distinct “routes.” The central route is that which is associated with intensive cognition and logical reasoning. Positive thoughts generated through these cognitive processes will prompt positive changes in attitude, while negative thoughts will have the opposite effect. The peripheral processing route demands far fewer cognitive resources than the central route. Rather than relying on logical analysis, peripheral processing relies on “cues” in order to process information more efficiently. These cues consist of elements like source credibility, positive affect, and number of arguments presented. If the message receiver is not motivated to process the message (because it is less relevant, uninteresting, etc) or if she is unable to process the message (because she lacks the necessary expertise, focus, etc), she will look for the presence of one or more peripheral cues. This will trigger a peripheral attitude shift in the receiver (p. 132-134). This shift, however, tends to be temporary, inconsistent and unpredictable of behavior (p. 167). Thus, the primary use of the ELM in practical applications has been to design messages that encourage central route processing in order to achieve permanent attitude change.

The HSM takes many of the ideas of ELM and iterates upon them. Whereas ELM conceptualizes cognition as a dichotomy between central and peripheral processing routes, HSM looks at cognition as a continuum with highly systematic thinking on one end and pure heuristics on the other. Neither process is mutually exclusive and indeed,

both tend to often occur at the same time. Depending on the message and cues presented, both the systematic and heuristic processing can work either for or against attitude change (Skalski & Tamborini, 2007, p. 388). HSM also explicitly states that systematic thinking can be biased or unbiased and that heuristic rules are part of learned knowledge structures (Chaiken, Liberman & Eagly, 1989, p. 212-213). These biases to systematic processing can come from certain heuristic cues, or from other factors such as prior knowledge, vested interests and personal preferences (p. 229).

Although both systematic and heuristic processing influence attitudes, persuasive strategies based upon cognitive models like the HSM tend to focus on systematic processing as the goal of persuasive communication. As previously mentioned, attitude change caused by heuristic processing tends to be unpredictable and temporary. Thus, in any information processing view of persuasion, only message-relevant information or evidence is capable of creating long-term attitude change (Allen & Stiff, 1989, p. 417). Other information that is not directly tied to the message itself can only influence the persuasive process by triggering heuristic cues. For example, in most situations the attractiveness of a speaker is only significant inasmuch as it triggers heuristic cues related to source credibility. However, if the speaker were discussing her use of a beauty product, her attractiveness would be an indicator of the effectiveness of the product and therefore message-relevant information that can be considered in systematic processing (Skalski & Tamborini, 2007, p. 394). Although short-term attitude change is sometimes desirable, as in the case of an election, most persuasive campaigns are designed primarily to encourage systematic processing of the message, rather than to attempt to trigger heuristic responses (Allen & Stiff, 1989, p. 423).

## **PERSUASION IN VIDEOGAMES**

Although games created for persuasive purposes have been around for many years, academic interest in the persuasive power of videogames has only become prevalent in the last ten years, largely due to Bogost's theory of Procedural Rhetoric. Procedural Rhetoric is the way in which ideology is embodied by the very rules that make up a game (Bogost et al., 2005) or, in other words, the authoring of arguments through processes (Bogost, Ferrari & Schweizer, 2010, p. 130). By playing a game, the player accepts certain rules as given, whether it be the ability to jump a certain height, the importance of acquiring wealth or the necessity of killing certain characters in order to progress. These rules are created by humans – game designers and programmers. As such, these rules are a product of the culture and ideology of their creators.

More often than not, the procedural rhetoric of videogames is unintentional. This rhetoric often conflicts with the visual or narrative themes of the game. For example, Bogost notes that although the game *Grand Theft Auto IV: San Andreas* is thematically centered around crime and inner-city life, the gameplay revolves around responsibly managing money, developing self-discipline and succeeding on your own merits – a distinctly conservative worldview (Bogost, 2006, p. 176-179). If the player is to succeed at the game she must, at least temporarily, accept this worldview and adjust her in-game behaviors accordingly. The fact that such ideological framing is usually implicit means that the player is less likely to be aware of any persuasive influence, which only serves to increase the game's persuasive power (see Benoit, 1998, p. 146-147).

Most commercial games are not designed with explicit persuasive intent (with the possible exception of the ever-increasing number of games that feature product placement), however, many individuals and organizations have released games designed to convey a persuasive message for the purposes of activism, advertising, education or politics. Often, these games are little more than traditional games with written or visual rhetoric scattered throughout (Bogost, 2007, p. 103). Other times, persuasive games will mount a procedural rhetoric, conveying the message not through the addition of images and text, but through the very rules of the game. One such game is *Tax Invaders* (Republican National Committee, 2004), a game released by the GOP during the 2004 presidential elections. The game is a clone of the classic arcade game *Space Invaders*. In this game, however, the titular antagonists have been replaced with representations of John Kerry's tax plans and the player controls the disembodied head of George W Bush. Although the game is somewhat crude, it contains a very sophisticated procedural rhetoric. As Bogost notes, the game frames taxes as invaders – harmful outside entities that threaten the well-being of the country. The only way to defend against these taxes is to have the help of George Bush to “shoot them down.” In this sense, the rules of the game embody the conservative conceptualization of taxation as theft (p. 104-106).

Although *Tax Invaders* expertly captures the conservative rhetorical framing of tax policy in its underlying rules, its actual persuasive ability is less certain. Indeed, the implementation of the game is so crude, both visually and programmatically, that even Bogost admits that he at first dismissed it, only to revisit it at a later time (Bogost, 2007, p. 104). If a game isn't even able to interest a videogame researcher on the first play, how much less likely is it to capture the attention of the general public? This suggests that if we want to look at the persuasive impact of a game, we need to look at more than simply the procedural “message.” We must also attempt to evaluate the factors that contribute to our cognitive processing of that message.

Just as rhetorical arguments can be embedded within the structure of a game's logic, so too can heuristic cues. Shyam Sundar (2008) has proposed the MAIN (Modality, Agency, Interactivity, and Navigability) model as an approach to understanding the effects of technology on persuasion. This model specifically addresses the problems of information overload and lack of uniform quality that are common in digital media (p. 77). Heuristic cues are conveyed to the user by affordances or capabilities of the medium, broadly defined as modality, agency, interactivity, and navigability. These cues can trigger positive or negative heuristics, depending on how the affordance manifests itself, influencing the user's perception of source credibility and even biasing systematic processing. For example, Sundar notes that while interactive features on a website may trigger a heuristic based on their convenience, positively influencing the user's attitude toward the site, the need for additional user responses could also be seen as burdensome, negatively influencing the user's attitude (p. 79). Thus, any given affordance can transmit a number of different cues, which in turn can trigger many different heuristic responses.

Modality is closely related to the concept of medium. While most media are defined by a single modality (books and newspapers being primarily text, while radio is aural and television audiovisual), digital media tend to be composed of multiple modalities (Sundar, 2008 p. 80). Cues can be triggered by a single modality or by the interaction between multiple modalities. For example, in a number of studies, the presence of both text and pictures in informational and educational websites was shown to have a more positive reception than other modalities, due to its similarity to newspaper, which is generally seen as a credible source of information. Sundar refers to this as the *old-media*

*heuristic* (p. 81). Other heuristic cues associated with modality include the *realism heuristic*, where the content is perceived as being less mediated or a more accurate representation of the real world, and the *being-there heuristic*, which is triggered by the feeling that the medium has transported the user to a different place (p. 81-82). Videogames tend to be very multimodal, both in output and input. Output modalities can include audiovisual information, text-based menus or heads-up displays, and even haptic feedback. Input modalities were once primarily limited to keyboard, mouse and gamepad, though they have now diversified greatly, making motion control, touchscreens, and even voice control much more common.

Both the agency and the interactivity affordances are closely tied to the user's interaction with the system. Agency refers to the user's ability to make meaningful choices, while interactivity is more closely related to how the system handles those choices. Agency affordances can trigger such cues as the *control heuristic*, which is based on the level of control felt by the user, the *identity heuristic*, which is cued by the user's ability to customize the media artifact in a way that allows her to express herself, and the *social-presence heuristic*, which is triggered when the user feels that she is interacting with another entity with agency (Sundar, Oeldorf-Hirsch, and Garga, 2008, p. 224). Cues related to interactivity include the *telepresence heuristic*, which is triggered when the user's ability to interact with the virtual environment makes it seem like she is really there, and the *flow heuristic*, which is related to the consistency of the mediated experience (Sundar, 2008 p. 87).

The navigability affordance relates to the spatial metaphors that are common among digital media, such as “cyberspace,” “digital divide” and “information superhighway” (Sundar, 2008, p. 88). Well-designed virtual spaces that are easy to navigate can trigger positive cues such as the *browsing heuristic*, which occurs when the user is free to explore and investigate the space with ease, and the *play heuristic*, which when a user experiences enjoyment through simply using a digital device (p. 89-90).

If we turn once again toward *Tax Invaders*, we can see that the game falls short in a number of areas. It is likely to trigger a number of negative heuristic cues, while triggering very few positive ones. The flow heuristic is easily disrupted due to both the game's low difficulty and it's numerous inconsistencies, such as fluctuations in enemy speed, errors in collision detection and even an easily replicable bug that allows the enemy taxes to pass right around George Bush and off the screen. Enemy projectiles, which at first seem to be fired by the enemy, as in the original game, actually seem to appear randomly across the screen for no apparent reason, again disrupting flow, but also potentially triggering a *distraction heuristic* (Sundar, 2008, p. 82), as the player must now attempt to visually track dozens of deadly objects that don't seem to actually be associated with the enemies she is supposed to be fighting. The game fails to trigger positive cues like realism, as the descending text boxes are even more abstract than the pixel aliens of the original. It would, however, most likely trigger the play heuristic, even if it's not the most compelling gameplay, and possibly even the *authority heuristic* (p. 84), either due to the presence of then President Bush's head or due the fact that the game was sponsored by the Republican National Committee.

Although the interaction of even these few cues could produce some very complex heuristic responses, it seems reasonable to assume that Bogost's initial dismissal of the game was not an anomaly. The overabundance of negative heuristic cues increases the likelihood that players from the general public would consider the game a low credibility

source, as well as the likelihood that players will give up entirely. In the latter situation, the game is actually helped by the fact that it is so short that it can be completed in less than thirty seconds.

A more effective example of using heuristic cues can be seen in the game *Unmanned* (Molleindustria, 2013), which deals with the use of unmanned military drones. The game places the player in the role of a drone gunner, juxtaposing the impersonal act of remotely killing alleged terrorists with other mundane tasks, such as shaving and driving to work. The game features a significant number of conversations with other characters, often requiring a response from the player, even while she is engaged with other activities within the game. This is unusual, particularly for games with a military context, and is likely to trigger a social-presence heuristic. The ability to use these conversations to shape the player character (for example, making him either a faithful or unfaithful husband) could also potentially trigger a *control heuristic* (Sundar, 2008, p. 87), though this sense of control is deliberately undermined in other aspects of the game. Triggering of realism heuristics is also somewhat ambiguous, as the game takes on a highly stylized and unrealistic art style, yet provides excessive detail in other aspects of the game, such as the tendency for the player's car to pull to the left or the potential for the player to be cut while shaving.

## **PRESENCE AND PERSUASION**

Closely tied to the persuasive power of videogames is the concept of presence. Greater perceptions of presence tend to strengthen heuristic cues related to the message source (Skalski & Tamborini, 2007, p. 386; Skalski et al, 2009, p. 141). Perhaps more significant, however, is the fact that greater presence has been shown to increase the amount of cognitive processing performed on the message (Skalski & Tamborini, 2007, p. 408). This makes understanding the nature and function of presence in the context of videogames important to the design of persuasive games.

The idea of getting “sucked in” is a common metaphor for the immersive qualities of digital media, particularly videogames. Despite the ubiquity of this concept, it remains difficult to narrowly define. Lombard and Ditton (1997) define presence as simply “the perceptual illusion of nonmediation.” They found that people generally conceptualized presence in six ways, as social richness, as realism, as transportation, as immersion, as social actor within medium (para-social interaction) and as medium as social actor (anthropomorphizing the system itself). This view of presence was strongly influenced by the emerging technologies of the time, such as video conferencing, 3D graphics and speech synthesis.

This broad concept of presence was specifically adapted for videogames by McMahan (2003), who took the general idea of being “sucked in” to a game and divided it into three distinct phenomena: Immersion, Engagement and Presence. Immersion refers to the player's sensation of being part of the game world to the exclusion of the physical world (p. 68). It is closely related to the player's involvement in the narrative of the story and identification with in-game characters. Engagement also depends on the player's involvement in the game, but in a nondiegetic way. Rather than losing touch with the physical world in favor of the virtual world, an engaged player is very much aware of the virtuality of the game world. Engagement focuses on the mastery of the game – earning points, devising strategies and interacting with other players (p. 69). While an immersed player might be aware of the grave significance of a dragon appearing on the outskirts of the peaceful village, an engaged player will be more aware of the dragon's vital statistics,

vulnerable areas and AI behaviors. Although immersion and engagement are certainly not mutually exclusive, they can often be at odds with each other.

McMahan's conceptualization of presence is very similar to that of Lombard and Ditton, with a great deal of focus on sensory immersion (McMahan, 2003, p. 75-79). Her view of presence, like theirs, was rooted in technologically deterministic factors. While Lombard and Ditton were concerned with advances in VR (virtual reality) and simulation technology, McMahan was concerned with industry shifts toward more and more sophisticated forms of 3D graphics (p. 70-71). In both cases, it is possible to make the same inference: In order to create a greater sense of presence, you just need better technology.

Seegert (2009) offers us a different perspective on presence. He notes that while most attempts at creating presence focus on presenting the user with accurate perceptual representations of the real world, these view presence as a largely passive phenomenon. He argues that presence is not a passive experience, but a performative one (p. 24). Thus, presence is evoked most effectively when the user must respond to something cognitively, rather than simply being subjected to external stimuli (p. 24-27). He goes on to analyze “interactive fiction” games, more commonly known as text adventures. Unlike most modern videogames, text adventures generally lack any graphical component other than the text that describes to the player what is happening within the game world. The player's mode of interaction is through the use of a simple text input field, which allows the player to type in a command for her character to perform. Although there are no graphics, the input method allows for a high degree of interactivity, as the player is not limited by the number of buttons on a gamepad, but only by the number of terms that the designer was willing to program into the text parser. While this view of presence is very different from the previous definitions, it manages to closely link the theoretical construct of presence with the need for active cognition.

Although the MAIN model has primarily been used to look at the effects of technology on source credibility, Sundar, Oeldorf-Hirsch, and Garga (2008) examined the way in which the heuristic cues transmitted by technological affordances can influence perceptions of presence (p. 222-223). Of the numerous heuristic cues that Sundar (2008) identified, they highlight nine as being particularly relevant to the perception of presence:

While the modality affordance cues realism and being-there heuristics, the agency affordance triggers the control, social presence, and identity heuristics, the interactivity affordance cues the telepresence and flow heuristic, and navigability cues browsing and play heuristics (Sundar, Oeldorf-Hirsch, & Garga, 2008, p. 226)

These nine cues, then, are capable of not only achieving the temporary shifts in attitude associated with positive heuristic processing, but of triggering the sensation of presence for the user. This sensation then increases the amount of cognitive processing being performed, thus increasing long-term attitude change as well.

## **IMPLICATIONS, LIMITATIONS AND CONCLUSIONS**

Since most of the processes that cognitive models of persuasion like the HSM attempt to explain are internal, it can be very difficult to measure the impact of specific heuristic cues. The use of the MAIN model offers a way to begin analyzing the impact of very specific heuristic reactions, based on ten years of empirical work conducted in laboratory

settings (Sundar, Oeldorf-Hirsch, & Garga, 2008, p. 222). The list of cues provided by the MAIN model is not intended to be comprehensive, but rather serves as a solid starting point for the study of technological influences on cognition (p. 226).

Although the approaches laid out in this paper present a number of interesting theoretical possibilities, there are also a number of limitations of these theories. Perhaps most significantly, while the focus of this paper is persuasion in the context of videogames, the ability to use heuristic cues to evoke presence does not necessarily imply favorable persuasive outcomes, only greater cognition. Thus, a message that fails to target the desired attitudes or fails to provide compelling evidence for systematic cognitive processing is unlikely to achieve its desired effect, even if it is able to evoke a sense of presence in the message recipient. Indeed, this is a common criticism of persuasive games.

A prime example of this phenomenon, as noted by Bogost (2007), is the *Howard Dean for Iowa* game, which he co-designed. The game was designed to procedurally embody a rhetoric of grassroots political action, with the player taking the roll of a Dean supporter in the campaign for the Iowa caucus (p. 136). Bogost argues that the game failed as a campaign tool not because it did not effectively represent grassroots outreach, but because it only promoted grassroots action in a general sense. While the player might be persuaded to get involved with grassroots politics, there is no clear reason for her to vote for Howard Dean (p. 139). Likewise, while the use of the MAIN model may be an effective tool in promoting systematic cognitive processing, this will only result in positive attitude change if the message of the game is successful in generating favorable thoughts that are relevant to the attitude in question.

Another point that could significant limit this theoretical approach is that although the study by Skalski and Tamborini (2007) claims that the perception of presence increases message processing (p. 408), Skalski et al (2009) seems to suggest that presence promotes heuristic processing at the expense of systematic message processing in certain situations (p. 148-150). Although the reasons for this apparent contradiction are unclear, it could result from conflicting theoretical assumptions between HSM-based studies, like Skalski et al, that conceptualize heuristic and systematic processing as occurring simultaneously, and ELM-based studies like Slater (2002), that conceptualize cognitive processes as utilizing only a single processing route at a time. Such discrepancies also might be explained in terms of the MAIN model, which demonstrates that digital media can trigger heuristic cues that in turn promote presence and systematic processing, thus increasing both heuristic processing and systematic processing at the same time. In any case, due to the centrality of the link between presence and systematic processing to this approach, additional research to explicitly clarify the construct seems warranted.

The theoretical framework presented in this paper suggests a number of different directions for future research. First, as previously mentioned, the heuristic cues identified by Sundar (2008) are not necessarily the only cues that are triggered by the affordances of digital media. Also, while these cues are for the most part fairly generalizable across many different forms of digital media, they were not developed specifically in relationship to people's interaction with videogames. Since videogames tend to have both functional features and cultural significances that differ substantially from digital media like web pages, it seems reasonable that research directed at the technological affordances of videogames could yield new and unique results.

One aspect of videogames that deserves particular attention is the notion of procedurality. The procedural or algorithmic nature of games is both one of the medium's most powerful and distinguishing features as well as a key concept in theories like procedural rhetoric. Although many other media studied by the MAIN model can also be looked at procedurally, the MAIN model engages with this sort of criticism on only a very shallow level. Thus, while the fidelity of visual images to real world objects is highly relevant, the fidelity of player actions, such as the necessity of shaving and driving in *Unmanned*, is much harder to work into the current MAIN model.

Another advantage that approaches like procedural rhetoric have over cognitive models of persuasion is their ability to consider not only at choices available to the player, but choices that are withheld. Much of the impact of *Unmanned* is due to the heavy restrictions placed on the player. The game is not about flying triumphantly over the Middle-East as one might do in a modern military shooter. Instead of being exceptional, war is depicted as mundane and ironically juxtaposed with other mundane daily activities, thus creating cognitive dissonance for the player (Sicart, 2013, pp. 121-122). Although a number of recent studies have focused on the impact of satire and irony on persuasion from a cognitive standpoint (Holbert et al, 2013; Polk, Young, & Holbert, 2009; Nabi, Moyer-Gusé, & Byrne, 2007), these studies tend to focus primarily on how humor detracts from an audience's ability or desire to process arguments effectively. While irony is a central component to games like *Unmanned*, humor is often absent. Thus, in order to explain the experience of playing these games, it is necessary to expand current models to deal more directly with procedurality, irony, genre conventions, and so forth.

A second potential line of research lies in the study of the interaction between multiple heuristic cues. Although heuristic cues can produce complex interactions in heuristic reasoning, most of the cues presented here have been primarily dealt with in isolation. Further research might be able to shed light on the way that different heuristic cues behave with one another in combination. For example, does triggering the telepresence heuristic through interactivity affordances have the same effect when the user is simultaneously experiencing the identity heuristic through agency affordances? Such questions are not limited to the nine cues that have been explicitly connected with presence, but could also encompass interactions with all the other heuristic cues identified in the MAIN model.

A third direction for future research is suggested by the relationship between heuristic cues and the concept of presence. Although the work of Sundar, Oeldorf-Hirsch, and Garga (2008) effectively connects the MAIN model to the idea of presence, they deal primarily with the generalized view of presence as theorized by Lombard and Ditton (1997). This paper has argued for a more complex and nuanced view of presence, influenced by the work of McMahan (2003) and Seegert (2009). Although I would argue that much of the previous work on heuristic cues and presence is still valid and relevant when applied to this conceptualization of presence, there could be additional connections that had not been previously made. For example, the nine heuristic cues currently associated with presence are all closely associated with sensory and perceptual realism in videogames. This is unsurprising, given the deterministic view of digital technology presented by Lombard and Ditton. Given the recent resurgence in the popularity of VR technology following the development of the Oculus Rift, such views are likely to see a revitalization as well. Seegert's work, however, suggests that the perception of presence is not necessarily tied with a perceptually immersive digital environment. Although some heuristic cues, such as the old-media heuristic, have generally been considered irrelevant

to the discussion of videogames, a broader view of videogames as a medium, rather than a myopic focus on only the most cutting-edge mainstream games, might yield a very different picture of videogames and cognitive processing. For example, a text adventure might evoke a similar heuristic connection to books as the old-media heuristic triggered by the similarity between web pages and newspapers. Additionally, just as Sundar, Oeldorf-Hirsch, and Garga identified the heuristic cues associated with presence, it might also be possible to identify cues associated with other similar psychological constructs, such as McMahan's immersion and engagement, in order to evoke other specific psychological states in message recipients.

This theoretical framework also has a number of practical implications for videogame design and digital persuasion. The most apparent of these is the utility that such a theoretical framework has on the design of persuasive games. The heuristic cues presented here provide a well-defined set of parameters for game designers in designing the technological affordances present in a persuasive game. This gives designers a ready-made toolbox for customizing the structure of the game to the needs of the persuasive message contained therein. Additionally, while this paper generally operates under the assumption that increased message processing is desirable in persuasive situations, there are instances when a persuader might want to decrease systematic processing in favor of more heuristic processing (see Allen & Stiff, 1989, p. 423). Because the MAIN model isolates individual heuristic cues, designers could also more easily design their technological affordances to increase heuristic processing while avoiding increases in cognitive states like persuasion that might increase systematic processing.

Additionally, this work has implications for persuasion in digital media other than videogames. Although the idea of presence is generally equated with the concept of virtual worlds created in videogames and virtual reality, particularly in more technologically deterministic literature, a more nuanced conceptualization of presence easily allows for its relevance in non-game situations. One such area of research in which presence is important is that of social agent technology, perhaps best known in the form of "Clippy," the animated paperclip found in previous versions of Microsoft Word (Skalski & Tamborini, 2007, p. 386). Although social agents are thought to increase the perception of presence when interacting with the program, thereby creating more positive reactions, social agents like Clippy have been almost universally loathed by users (see Gentilviso, 2010; Booker 2012). Although social agents may create greater presence than traditional human-computer interfaces, such dislike for social agents can easily be explained through heuristic cues such as the intrusiveness heuristic, the bells-and-whistles heuristic, and the distraction heuristic (Sundar, 2008, p. 81-83).

Videogames are an increasingly common medium for persuasion. They are becoming important tools in many fields that have long been central to the interests of persuasion researchers, such as in political campaigning (Bogost, 2007; Bogost, 2006) and in promoting positive health behaviors (Bruggers et al, 2012, Bandera, 2004). As the importance of videogames in these fields grow, it becomes imperative that theoretical understanding of how videogames function in such roles grows along with it, providing designers and researchers the tools to fully utilize the potential of the medium.

## BIBLIOGRAPHY

- Allen, M. & Stiff, J. B. (1989). Testing three models for the sleeper effect. *Western Journal of Speech Communication*, 53, 411-426.
- Aunte Pixelaunte. (2012). *dys4ia*. Newgrounds. Videogame. Available online at <https://www.newgrounds.com/portal/view/591565>
- Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior*, 31(2), 143-164.
- Benoit, W. L. (1998). Forewarning and persuasion. In M. Allen, & R. W. Preiss (Eds.), *Persuasion: Advances through meta-analysis* (pp. 139-154). Cresskill, NJ: Hampton.
- Bogost, I., Ferrari, S and Schweizer, B. (2010). *Newsgames: Journalism at Play*. Cambridge, Massachusetts: The MIT Press.
- Bogost, I. (2007). *Persuasive games: The expressive power of videogames*. Cambridge, Massachusetts: The MIT Press.
- Bogost, I. (2006). Videogames and Ideological Frames. *Popular Communication* 4.
- Bogost, I., Mateas, M., Murray, J. & Nitche, M. (2005). Asking What Is Possible: The Georgia Tech Approach to Videogame Research and Education. *The International Digital Media & Arts Association Journal*, 2:1.
- Booker, E. (2012). Windows' Worst Mistakes: From Clippy To Vista. *InformationWeek*. Online. Retrieved December 17, 2012 from <https://www.informationweek.com/software/windows8/windows-worst-mistakes-from-clippy-to-vi/240009646>
- Bruggers, C. S., Altizer, R. A., Kessler, R. R., Caldwell, C. B., Coppersmith, K., Warner, L., ... & Bulaj, G. (2012). Patient-Empowerment Interactive Technologies. *Science Translational Medicine*, 4(152), 152ps16-152ps16.
- Chaiken, S. Liberman, A. & Eagly, A. H. (1989). Heuristic and systematic processing within and beyond the persuasion context. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 212-252). New York, NY: Guilford Press.
- Gentilviso, C. (2010). The 50 Worst Inventions. *Time*. Online. Retrieved December 17, 2012 from [http://www.time.com/time/specials/packages/article/0,28804,1991915\\_1991909\\_1991755,00.html](http://www.time.com/time/specials/packages/article/0,28804,1991915_1991909_1991755,00.html)
- Hespos, T. (2011). Welcome to the World of Aggressively Viral Advergimes. *Advertising Age*. Online. Retrieved December 13, 2012 from <http://adage.com/article/digitalnext/world-aggressively-viral-advergimes/149256/>
- Holbert, R. L., Tchernev, J. M., Walther, W. O., Esralew, S. E., & Benski, K. (2013). Young Voter Perceptions of Political Satire as Persuasion: A Focus on Perceived Influence, Persuasive Intent, and Message Strength. *Journal of Broadcasting & Electronic Media*, 57(2), 170-186.
- Lombard, M., & Ditton, T. (1997). At the heart of it all: The concept of presence. *Journal of Computer-Mediated Communication*, 3(2).
- McMahan, A. (2003). Immersion, engagement and presence. In M. J. P. Wolf & B. Perron (Eds). *The video game theory reader*, 67-86.
- Molleindustria. (2013). *Unmanned*. Videogame. Available online at <http://unmanned.molleindustria.org/>
- Nabi, R. L., Moyer-Gusé, E., & Byrne, S. (2007). All joking aside: A serious investigation into the persuasive effect of funny social issue messages. *Communication Monographs*, 74(1), 29-54.

- Petty, R. E. & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In Berkowitz (Ed.), *Advances in experimental social psychology*, vol. 19 (pp. 123-205). San Diego, CA: Academic Press.
- Polk, J., Young, D. G., & Holbert, R. L. (2009). Humor complexity and political influence: An elaboration likelihood approach to the effects of humor type in The Daily Show with Jon Stewart. *Atlantic Journal of Communication*, 17(4), 202-219.
- Radd, T. (2007). The Secrets of Advergaming. *Businessweek*. Online. Retrieved December 17, 2012 from <http://www.businessweek.com/stories/2007-05-23/the-secrets-of-advergamingbusinessweek-business-news-stock-market-and-financial-advice>
- Republican National Committee. (2004). *John Kerry: Tax Invaders*. Videogame.
- Seegert, A. (2009). 'Doing there' vs. 'being there': performing presence in interactive fiction. *Journal of Gaming and Virtual Worlds*, 1:1.
- Sicart, M. (2013). *Beyond Choices: The Design of Ethical Gameplay*. Cambridge, Massachusetts: MIT Press.
- Skalski, P., Tamborini, R., Glazer, E., & Smith, S. (2009). Effects of humor on presence and recall of persuasive messages. *Communication Quarterly*, 57(2), 136-153.
- Skalski, P., & Tamborini, R. (2007). The role of social presence in interactive agent-based persuasion. *Media Psychology*, 10(3), 385-413.
- Slater, M. D. (2002). Involvement as goal-directed strategic processing: Extending the Elaboration Likelihood Model. In J. P. Dillard & M. Pfau (Eds.), *The persuasion handbook: Developments in theory and practice* (pp. 175-194). Thousand Oaks, CA: Sage.
- Story, M. (2009). When "Advergame" isn't a bad word. *ClickZ*. Online. Retrieved December 17, 2012 from <http://www.clickz.com/clickz/column/1711359/when-advergame-isnt-bad-word>
- Sundar, S. S., Oeldorf-Hirsch, A., & Garga, A. (2008). A cognitive-heuristics approach to understanding presence in virtual environments. In PRESENCE 2008: *Proceedings of the 11th Annual International Workshop on Presence* (pp. 219-228).
- Sundar, S. S. (2008). The MAIN model: A heuristic approach to understanding technology effects on credibility. In M. J. Metzger & A. J. Flanagin (Eds.), *Digital media, youth, and credibility* (pp. 72-100). Cambridge, MA: The MIT Press.
- U.S. Army. (2002). *America's Army*. Videogame.
- Waugh, E. (2005). Event Wrap-Up: Advertising in Games West. *Gamasutra*. Online. Retrieved December 17, 2012 from [http://www.gamasutra.com/view/feature/2362/event\\_wrapup\\_advertising\\_in\\_.php](http://www.gamasutra.com/view/feature/2362/event_wrapup_advertising_in_.php)