

IAA-PDC-23-0X-XX
APOPHIS AS THE DEMON SERPENT OF DARKNESS: DESIGNING COMMUNICATION
PROTOCOLS FOR MISINFORMATION AND CONSPIRACY THEORIES IN PLANETARY DEFENSE

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Keywords: *Misinformation, Conspiracy Theories, Apophis, Communication Strategies*

Extended Abstract—

Potentially Hazardous Asteroid (99942) Apophis will fly past Earth at an unprecedented distance on Friday, April 13, 2029. Despite its ominous name which refers to a serpent of chaos and evil in Egyptian mythology, we know with certainty that Apophis poses no threat to humanity during this encounter, and confidently assess that it even poses no threat for the next century [1]. This presentation argues that the Apophis event will not only provide an opportunity to educate people about planetary defense broadly, but that Apophis should also serve as a test case for stakeholders to confront the inevitable misinformation and conspiracy theories that surround planetary defense.

In March 2022, NASA, FEMA, and planetary defense experts conducted a simulation wherein a Near Earth Object would strike Winston Salem, North Carolina. The results highlight the urgency for the planetary defense community to design protocols to deal with misinformation and conspiracy theories. According to August Vernon, the Winston-Salem emergency management director, when it came to simulating an evacuation, "...20 percent of people would not leave because it was all fake news or the government was lying or some other reason" [2]. This presentation will review a set of communication strategies designed to anticipate, confront, and reduce the power of misinformation related to planetary defense. The goal of the presentation is to persuade stakeholders to use the Apophis event as an opportunity to establish communication protocols related so the planetary defense community can be proactive rather than reactive when misinformation and conspiracy theories inevitably enter the public discourse.

In order to understand why some people would ignore the science and embrace conspiracy discourse, we must begin with an examination of Reactance Theory. First theorized by J.W. Brehm in

1996, Reactance Theory helps explain why people behave in seemingly counter-productive ways in the face of clear scientific evidence to the contrary. According to Reactance Theory, "In general, people are convinced that they possess certain freedoms to engage in so-called free behaviors. Yet there are times when they cannot, or at least feel that they cannot, do so. Being persuaded to buy a specific product in the grocery store, being forced to pay tuition fees, being prohibited from using a mobile phone in school, and being instructed to perform work for the boss are all examples of threats to the freedom to act as desired, and this is where reactance comes into play. Reactance is an unpleasant motivational arousal that emerges when people experience a threat to or loss of their free behaviors" [3].

Reactance Theory suggests that people experience anger and frustration at the idea of a loss of freedom. How they react to that anger and what behaviors they adopt in the face of a perceived loss of freedom vary based on a number of variables. The literature suggests that "The amount of reactance depends on the importance of the threatened freedom and the perceived magnitude of the threat" [4]. For some people, being asked to wear a mask to help reduce the spread of COVID-19 was viewed as a loss of freedom resulting in anger, violence, and some people embracing behaviors that defied mask mandates in the name of preserving their individual freedom.

An essential element of the Reactance Theory literature relates to how people experiencing reactance will challenge the credibility of the sources justifying the perceived loss of freedom [5]. That makes the transition to believing misinformation and conspiracy theories more seamless as people look for alternative justifications for resisting the calls for behaviors that they perceive to be restrictions on their freedoms.

The exercise based in Winston Salem, NC revealed that 20% of the population in that city would reject the messages from the planetary defense community to their own peril. Evacuations are the ultimate loss of freedom. People are told to leave

their homes, their jobs, their lives, and that the alternative is their complete destruction. On the one hand, this may represent the complete scientific truth of the situation. On the other hand, messaging that focuses on telling people that they have no control over an external event that threatens their freedoms is a recipe for reactance.

This presentation argues that the planetary defense community should consider the 2029 Apophis flyby as a case study in how to communicate with audiences in ways that reduce the inevitable reactance that will be triggered by the thought of losing their freedoms in the event of an evacuation. Specifically, the presentation argues that social scientists should design a communication intervention based on the tenets of Reactance Theory and test whether subjects exposed to the intervention experienced less reactance than the control group. The literature suggests “that reactance can indeed be measured. It is possible to assess people’s experience of a threatening situation, the cognitive and affective processes that are activated by it, and the physiological arousal and activity in the brain that accompany the attempt to restore freedom” [5].

The Reactance Theory literature suggest key communication concepts that are important for building credibility about events that have the potential to threaten a person’s sense of freedom. For example, “Persuasive messages arouse reactance especially by using forceful and controlling language, such as the terms should, ought, must, and need. This language has been shown to be perceived as more threatening and as eliciting more reactance than noncontrolling language, such as the terms consider, can, could, and may” [6]. Additionally, “For short messages, it has been found that the framing of the message as loss (e.g., “When you do not use sun protection you will pay costs.”) led to a significantly stronger perception of threat than a gain frame (e.g., “When you use sun protection you will gain benefits.”) and that the perceived threat was positively correlated with anger but not with negative cognitions” [7].

These are just a few of the concepts that would be essential in developing an intervention to test the efficacy of communication protocols for the planetary defense community that were designed to reduce reactance. There is no way around the fact that some messaging related to planetary defense is scary and may require people to pick up and move their lives to preserve them. The key question is whether or not there is a way to present those options in a way that reduces the likelihood that a significant portion of the audience experiences reactance and decides to embrace conspiracy theories and misinformation as an alternative to the perceived loss of freedom.

In the end, it may be inevitable that some portion of any given population simply will not evacuate on their own. They will choose to reject the science and devalue the credibility of the messaging because the alternative loss of freedom is too difficult for them to accept. If, however, the planetary defense community can find ways to adjust the messaging to account for Reactance Theory then it may be possible to develop protocols that have the best chance at motivating people to evacuate under the worst-case scenarios and/or support planetary defense as a method of reducing the need for evacuations (i.e., deflection). Either way, the 2029 Apophis flyby represents an opportunity for true interdisciplinary collaboration to determine what, if anything, is possible to help reduce the likelihood that 20% of a population refuses to evacuate.

Works Cited

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