Conspiracy Theorizing and Religious Motivated Reasoning: Why the Earth 'Must' Be Flat

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Abstract

Flat Earth ideology is arguably the paragon of science denial and one of the more famous historical examples of conflict between religion and science. The latest reemergence of Flat Earth ideology also appears to embrace conspiracy theorizing, disputing the Apollo Moon landings and accusing NASA of falsifying video footage and the Earth-from-space photography. To what extent, then, is accepting a flat Earth (and rejecting a spherical one) an attempt to reduce cognitive dissonance in the minds of flat-Earthers emerging from conflict between scientific consensus on the shape of the Earth and literalist interpretations of the Bible, and to what extent is this belief driven by extreme distrust of information provided by government institutions? Moreover, do Flat Earthers view themselves as skeptical consumers of scientific information, in similarity with climate skeptics? This study examined if (1) Biblical literalism and conspiracy ideation predict belief that the Earth is flat, and (2) people with higher conspiracy ideation (including those who hold Flat Earth beliefs) view themselves as more rational and logical than suspicious. Here, two samples were analyzed and compared: one recruited from a national online marketing panel ($N = 513$) and a sample of participants recruited from the first annual Flat Earth International Conference ($n = 23$). Results showed no significant difference in religiosity and belief in evolution between the two samples; however, the Flat Earth sample was significantly higher in conspiracy mentality. Results here also indicate that Flat-Earthers consider themselves significantly more skeptical and logical than the national sample.

Keywords: conspiracy theories; Flat Earth; motivated reasoning; science communication; public acceptance of science; public understanding of science; religious beliefs; worldviews

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CHAPTER I

INTRODUCTION

A curious and ostensibly grandiose idea has re-emerged from obscurity in the past couple of years—the belief that the Earth is flat. In a social media environment where facts are treated as subjective, sensational content attracts views, and trust in government and media are diminishing, arguments for a flat model of the Earth flourish. A quick search of "Flat Earth" on YouTube, for instance, produces close to 5 million results. A popular Flat Earth YouTube channel; *Globebusters*, boasts close to 40,000 subscribers and more than 4.5 million views as of August 2018 (GLOBEBUSTERS, n.d.). Unlike some online communities, the Flat Earth community also assembles in public. The first ever International Flat Earth Conference took place in Raleigh, N.C. in November of 2017. Subsequent conferences held in Birmingham, England in April and Edmonton, Alberta in August of 2018 were sold out. Moreover, yet another conference is scheduled to be held in Denver in November of 2018.

Many consider Flat Earth belief to be grounded in conspiracy theory, including many Flat-Earthers themselves (Flat Earth Society, n.d.), in which world governments and scientific institutions are actively faking space travel and either intentionally hiding the true nature of the Earth's shape (Waugh, 2018), or are supposedly ignorant of the Earth's true shape and are faking space travel for "militaristic dominance of space" (Flat Earth Society, n.d.). However, others find the word "conspiracy" to have a negative connotation, implying the belief is not true. One Flat Earth conference attendee mentioned that he was "not a conspiracy theorist, but a truth seeker." Conspiracy theories are generally defined as explanations for events which involve multiple actors secretly

working together, pursuing malevolent or unlawful goals (Clarke, 2002; Zonis & Joseph, 1994). They are found among diverse demographics and those with varying political attitudes (e.g., Goertzel, 1994) and are prevalent in countries around the world (e.g., Byford & Billig, 2001; Zonis & Joseph, 1994).

Conspiracy theorizing is a deep-rooted aspect of American society (e.g., Blaskiewicz, 2013; Haspel, 2013; Lewandowsky, Gignac, & Oberauer, 2013a; Lewandowsky, Oberauer, & Gignac, 2013b; Sussman, 2010); even the battle for independence from England was launched amid fears of real and imagined enemies, both internal and external (Knight, 2000). Conspiracies have become more prominent in political and cultural life in recent decades, dating to the assassination of President Kennedy in 1963 (Knight, 2000). Today, new media are playing an increasingly significant role in their proliferation (Craft, Ashley, & Maksi, 2017). In fact, a recent nationally representative survey reported that more than half of the U.S. population consistently endorse conspiracy theories about current political events or phenomenon (Oliver & Wood, 2014). Furthermore, while popular conspiracy theorists like Alex Jones claim audience sizes of 5 million daily radio listeners, and his online video views have topped 80 million in a single month (Roig-Franzia, 2016).

A seemingly unique combination of conspiracy beliefs (e.g., NASA faked moon landings, "scientism" is a fraud) and Biblical literalism (e.g., young Earth; Creation/Evolution Continuum), Flat Earth ideology poses a unique challenge to advancing public trust in science. As one attendee of the Flat Earth International Conference described, his approach was to "Look at the science as well as Scripture and find out where they intersect." Certainly, we have known for centuries that the Earth is

not flat; and undoubtedly not all Biblical literalists, nor all conspiracy theorists, believe the Earth is flat. Why then do some people still believe (or come to believe) this idea in the face of modern scientific evidence?

Purpose of the Study

The purpose of the study is to determine whether, and if so, to what extent, (a) Religiosity and conspiracy ideation predict belief that the Earth is flat, and (b) whether people with higher conspiracy ideation (including those who hold Flat Earth beliefs) view themselves as more logical and rational than suspicious and distrusting. Much of the research around conspiracy ideation emphasizes its association with negatively-valenced psychological factors such as paranoia (Bruder, Haffke, Neave, Nouripanah, & Imhoff, 2013), delusion (Dagnall, Drinkwater, Parker, Denovan, & Parton, 2015), a tendency to engage in cognitive fallacies (Brotherton & French, 2014), and reduced analytic thinking, such as problem-solving using principles of logic and evaluation of evidence (Swami, Voracek, Stieger, Tran, & Furnham, 2014). Yet, Harambam and Aupers (2015) found from interviews that many conspiracy theorists view themselves as rational and critical thinkers, indicating a disparity between much of the research findings and how individuals with a strong conspiracy mentality view themselves.

Significance of the Study

In contemporary culture, conspiracy theorizing has been normalized to an extent that trusting or believing authorities' descriptions of events or phenomena is seen as being naïve (Aupers, 2012). Since real political conspiracies do exist and have, at times, been exposed (e.g., Watergate, the Iran-Contra affair) the plausibility of even far-fetched theories continues to grow, particularly in an age of social media (Aupers, 2012).

Contributing to the phenomenon, social media platforms like Facebook and YouTube allow users to create and share misinformation, including conspiratorial ideas, to wide audiences (Kata, 2012). An individual YouTube user, for example, unbeholden to truth, accuracy, or consistency, can in some cases reach an audience comparable to FOX News, CNN, or the *New York Times* (Allcott & Gentzkow, 2017).

Moreover, conspiracy mentality is of social significance because behavioral consequences are likely to stem from underlying orientations or attitudes, such as a distrust of science, governments and institutions, and a reluctance to vote (Einstein & Glick, 2014; Jolley & Douglas, 2014; van der Linden, 2015). If the goal of media research is to understand media audiences and how to craft effective messages, understanding conspiracy mentality and why some people are more susceptible to these beliefs than others is crucial to that endeavor. In view of the social significance of conspiracy beliefs, this study aims to contribute to the existing literature by probing some of the critical motivators for such beliefs, who holds them, and perhaps provide insight into methods for repairing their diminished faith in the scientific community.

Understanding where and how conspiratorial and religious belief systems interact is crucial to science educators and science communicators from diverse disciplines, considering beliefs grounded in religious outlooks incite much of the opposition to scientific evidence and theorizing (i.e., about evolution, climate change). To the extent that conspiracy ideation is widespread, it begins to pose a problem for the maintenance of a rationale public sphere where discussions and policy debates take place with evidence in hand, rather than trafficking in suspicions that a hidden cabal has manipulated events to push an unspoken agenda. As new information gets filtered through these

conspiratorial belief systems, they can greatly affect public perceptions of and support for science.

CHAPTER II

LITERATURE REVIEW

Flat Earth Beliefs

Modern Flat Earth ideas can largely be traced back to English religious fundamentalist Samuel Rowbotham who, in 1849, launched a pamphlet discussing "Zetetic Astronomy" and later published a longer book version of the pamphlet called "Earth Not a Globe" in 1873 (Schadewald, 1981, p. 45). The years between 1860 and 1890 saw the rise of a movement based on the portrayal of Western history as a perpetual struggle between science and religion, with science and progress the victors and theology in retreat (Gould, 1996). According to Gould (1996), this is the false dichotomy from which Flat Earth ideology was born. In this view, science and religion constitute separate ways of acquiring knowledge (fact vs. values) and need not be at odds with one another (Gould, 1997). But that's not the way Flat Earthers see it.

The Universal Zetetic Society eventually became the International Flat Earth Research Society (Schadewald, 1980), and today there are a number of different splinter groups with slightly different beliefs (e.g., The Flat Earth Society[1], The Infinite Plane Society, Flat Earth Society of Canada[2], The Flat Earth Movement). A principal guiding philosophy for each group, however, is their staunch individual-level empiricist approach to discovery, in that they believe that relying on one's own senses, combined with a

[1] Originally known as the Universal Zetetic Society, the group then became the International Flat Earth Research Society in 1956. In 1971, the International Flat Earth Research Society of America and Covenant People's Church in California was founded which then became the Flat Earth Society as it is known today. In 2004, the Flat Earth Society was re-launched via an internet discussion forum, which then initiated the official relaunch in October 2009 with a new website, which claims more than 550 members as of October 2018.

[2] Established in November 1970 and relaunched in 2016, the Flat Earth Society of Canada eventually merged with the Flat Earth Society.

philosophical skepticism about the world, is the best approach for discerning the true nature of reality (e.g., Flat Earth Society FAQ "What evidence do you have," 2018; Wolchover, 2017).

Despite small differences in beliefs, the prevailing mental model of the earth among modern Flat-Earthers is one of a disc-shaped flat plane with the North Pole at the center and the continents laid out around it, not unlike the image depicted in the United Nations flag (Loxton, 2014; Schadewald, 1980) (see Figure 1). Antarctica is believed to be a wall of ice surrounding the disc and holding in the oceans, as opposed to a continent (Loxton, 2014; Schadewald, 1980). From there, different Flat Earth groups diverge on specifics. The Flat Earth Society's website, for example, discusses the force of gravity as a result of the Earth "disc" accelerating upward through space (Flat Earth Society). A recent, and more vocal, group of Flat-Earthers, however, take issue with this notion of gravity because in their view the Earth is stationary as depicted in the Bible. Instead, they have their own explanations for the force of gravity as a manifestation of density and buoyancy ("Gravity is Density," 2017).

Figure 1. Depiction of the Earth on the United Nations Flag. Like the mental model of the flat Earth, the north pole is depicted at the center of the two-dimensional image, with the continents laid out around it.

Many aspects of the modern Flat Earth model cite Biblical scripture: the Earth is stationary and at the center of everything, literally set atop pillars (1 Samuel 2:8), and the sky is a solid, transparent, and glasslike dome (Job 37:18) that "divides the waters above and the waters below" (Genesis 1:7). Thus, it seems apparent that religion, the Christian Bible in particular, plays a significant role in modern Flat Earth ideology. However, it should be noted that some groups take the Biblical connections more seriously than others. For example, the Flat Earth Society's website mentions that it is "neither officially or unofficially associated with any religion," while Flat Earth International Conference organizer Robby Davidson insists that "there are no atheists in Flat Earth" (Maimann, 2018). Is Biblical literalism and the long-standing conflict between religion and science, then, at the core of Flat Earth beliefs? Or do they simply not understand how science has demonstrated the shape of the Earth—have they not been shown the evidence?

Knowledge Deficit Model vs. Dissonance Reduction

An intuitive assumption about Flat-Earthers might be that they are lacking the requisite scientific knowledge about the true shape of the Earth. Indeed, this attitude is reflective of the broader scientific community's assumption regarding educating the general public about science-related matters, that simply providing more information will lead to support for scientific research, political action, or even scientific consensus (i.e., around evolution, climate change, or sphere Earth theory). This approach to communicating science has been dubbed the "public deficit model" (e.g., Bauer, Allum, & Miller, 2007) and its premise is that if only people *understood* the science better, then they would accept and *support* the science more readily (Nisbet, 2005).

This model, however, assumes that individuals are blank slates and are simply lacking the requisite information. According to Nisbet (2005), "the scientific community's perspective is based on the presumed existence of a fully informed public where opinion consists of individual judgments about an issue arrived at only after conscious and knowledgeable deliberation" (p. 91). That is, the scientific community assumes the public thinks the way scientists do, willing and able to discern the credibility of information, weigh evidence appropriately, and even seek out conflicting information or evidence to arrive at their own, fact-based conclusions. This assumption, while charitable, is fundamentally an unhelpful one.

Research has repeatedly demonstrated that individuals' priors (e.g., beliefs, attitudes, values, ideologies, worldviews, and other standing orientations) impact and shape their acceptance of science (NASEM, 2016a). In the case of climate change, for example, Republicans or conservatives are likely to avoid dissonance by seeking out

evidence from climate skeptics that conform with their beliefs and dismiss, reject, trivialize, and even call into question the reliability of contrary evidence. In some cases, higher science literacy can even increase the probability of rejecting scientific evidence. For example, Kahan et al. (2012) found that Republicans were more likely to reject climate change when they had greater science knowledge. That is, the more people knew about science, at least in this case, the more they were able to adapt the evidence to conform to their present beliefs and values. Are Flat-Earthers similarly conforming evidence to fit their belief-systems?

Resolving Cognitive Dissonance via Motivated Reasoning

According to Festinger's (1957) cognitive consistency principle, people are generally motivated to maintain consistency in their attitudes, values, and beliefs and experience cognitive dissonance (psychological discomfort) when encountering information that is contrary to their currently held views (Oliver & Krakowiak, 2009). Individuals are thus motivated to alleviate the discomfort and reduce dissonance by denying the new information, trivializing it, or conforming it to fit their prior beliefs or actions. This process is also known as motivated reasoning (Kunda, 1990).

Several psychological phenomena are associated with motivated reasoning. Biased information selection or selective exposure is the tendency to seek out and or disproportionately attend to information and sources congruent with the motivating goal (Sears & Freedman, 1967). Additionally, identity-protective cognition is exhibited by reacting dismissively to contrary information, the acceptance of which would cause dissonance or anxiety (Kahan, Braman, Gastil, 2007). For example, Kahan et al. (2007) found strong support for identity protective cognition in the context of the "white-male

effect." By combining cultural theory of risk with motivated cognition, they suggest that individuals assess dangers in a manner that supports their cultural identities (Kahan et al., 2007).

In the case of Flat-Earthers, their beliefs may be the result of a motivation to reduce cognitive dissonance when their religious views come into conflict with mainstream science. This time-honored conflict between religion and science has typically included three components: beliefs about evolution, Flat Earth (and geocentrism), and the age of the Earth (Draper, 1875; Scott, 2009).

Evolution, the age of the Earth, and the Earth's position and significance in the universe are common points of conflict between science and religion (Draper, 1875; Gould, 1996; Scott, 2009). The theory of evolution has been commonly understood by religious believers to imply that God's role in creating mankind has been hijacked (Scott, 2009). Further, the age and shape of the Earth, as seen by modern science, directly contradicts Biblical scripture's accounts. When viewed through a Biblical literalist lens, the view of the world is one of a flat, level surface where heaven and hell have physical locations above and below the plane of the Earth. Modern science, on the other hand, views the Earth as a globe (technically an oblate spheroid) with its size and location in and relationship to the solar system determined. Most significantly, however, the implication derived by these points is that humans are insignificant in the universe, and therefore likely to cause significant dissonance with the Biblical literalist worldview.

Through the lens of conspiracy belief, the idea that governments and scientific institutions are motivated to be honest with the public is absurd. Therefore, it would be naïve to simply accept the mainstream version of an even seemingly innocuous fact like

the shape of the Earth. Indeed, the biggest conspiracy of all would be hidden right under our feet, involving the very place we all live. Thus, when confronted with evidence such as photos of the Earth from space, cognitive dissonance reduction could potentially lead to the assertion that, "NASA faked it."

Conspiracy Theorizing as Motivated Reasoning

Miller, Saunders, and Farhart (2016) suggest that endorsement of conspiracy theories is a motivated process that functions to satisfy both ideological and psychological needs. They posit a theory suggesting that individuals who are high in political knowledge but lacking in trust (i.e., political sophisticates who are motivated to protect their worldview in which the conspiracy can be linked and are able to see the benefit in endorsing the conspiracy) are more likely to endorse ideologically motivated conspiracy theories, such as the belief that climate change is a conspiracy among scientists to sustain grant funding (Lewandowsky et al., 2013) or a left-wing conspiracy to harm the U.S. economy (Miller et al., 2016; Sussman, 2010). However, other scholars have noted that this notion of conspiracy endorsement as the simple satisfaction of needs is an incomplete explanation (Uscinski & Parent, 2014).

Consequently, an alternate strand of thought argues that conspiracy endorsement is a form of motivated reasoning (e.g., Kunda 1990; Lodge & Taber, 2013). Because conspiracy theories generally involve an alliance of powerful actors pursuing hidden malicious goals (Clarke, 2002), it is common for scientists and experts to be charged with these self-serving or even malevolent motivations (e.g., Kahan, Jenkins-Smith, & Braman, 2011; Miller et al., 2016). This then provides a justification for rejecting evidence contrary to one's beliefs and reduces any cognitive dissonance (e.g., Festinger,

1962). Suspecting the motivations of scientists rather than trusting the facts from evidence can be attributed to heuristic processing (e.g., Petty & Cacioppo, 1986). Rather than contending with fact-based arguments, critiquing a communicator's credibility can be an accessible way for lay audiences to evaluate claims when lacking sufficient scientific knowledge. (e.g., Landrum, Eaves, & Shafto, 2015; Petty & Cacioppo, 1986).

Since many conspiracy theories are political in nature, endorsing those that involve political opponents can serve as a mechanism for reinforcing and safeguarding one's political views (Kahan, Jenkins-Smith, & Braman, 2011). It is no wonder, then, that political ideology consistently predicts which conspiracy theories individuals will endorse (Nisbet, Cooper, & Garrett 2015; Nyhan, 2009; Oliver & Wood 2014; Uscinski & Parent 2014). Further, attempts at censoring conspiracy theories only works to solidify the belief by triggering confirmation bias and causing individuals to seek out idea-confirming information (Leman & Cinnirella, 2007; McHoskey, 1995; Miller et al., 2016). Douglas, Sutton, and Cichocka (2017) point to research derived from system-justification theory (Jost, Ledgerwood, & Hardin, 2008) indicating that people may be drawn to conspiracy theories that satisfy important epistemic, existential, and social motives.

Epistemic Motives

A key part of developing an accurate and consistent view of the world is the ability to find causal explanations for events (Heider, 1958). Causal explanations can reduce uncertainty and confusion when available information is conflicting, as well as provide meaning when events seem random (Douglas et al., 2017). Conspiracy theories differ, however, from other types of causal explanations in that they are speculative

(suggesting hidden actions), complex (implying coordination of multiple players), and unfalsifiable (implying that anyone who tries to debunk a conspiracy theory may, in fact, be part of the conspiracy) (Lewandowsky et al., 2015).

Some researchers find that belief in conspiracies are stronger among people who regularly seek meaning and patterns in their environment, including believers in paranormal phenomena (e.g., Bruder et al., 2013). Research also suggests that belief in conspiracy is stronger when people experience distress from uncertainty (van Prooijen & Jostmann, 2013) and when events are significant or unusually large in scale, leaving people discontented with matter of fact explanations (Leman & Cinnirella, 2013). Furthermore, correlations have been found with conspiracy beliefs and lower levels of analytic thinking (Swami et al., 2014) and education (Douglas et al., 2016).

Social Motives

Conspiracy theories, as with other causal explanations, are also influenced by social motives, involving the need for belonging and preserving a positive image of the self and immediate in-group (Douglas et al., 2017). Some scholars suggest that conspiracy theories absolve the self and the in-group of any blame for negative events by attributing them to others, thus, preserving the image of the self and the in-group as competent and moral, but threatened by powerful and corrupt others (Cichocka, Marchlewska, & Golec de Zavala, 2016). Indeed, conspiracy belief has been associated with *collective* narcissism – belief in the greatness of one's in-group and its lack of appreciation by others (Cichocka, Marchlewska, Golec de Zavala, & Olechowski, 2016). Bilewicz, Winiewski, Kofta, and Wójcik (2013) found that groups who believe they have

been victimized more often endorse conspiracies about powerful out-groups than groups who do not share this belief about victimization.

Despite these findings, it is not entirely clear that embracing conspiracy theories is a productive way to fulfill social motivations. A persistent characteristic of conspiracy theorists is their distrust of other people, institutions, and groups. Thus, the feelings of anomie and alienation commonly associated with conspiracy theories may be more associated with the personality of conspiracy theorists rather than symptoms that arise after embracing such views (e.g., Abalakina-Paap, Stephan, Craig, & Gregory, 1999). At the same time, conspiracy theory exposure *can* lead to decreased trust in institutions, even conspiracies unassociated with the institution (Einstein & Glick, 2015). Other studies have found that exposure to conspiracies can cause disenchantment with politicians and scientists (Jolley & Douglas, 2014a). It appears, therefore, that conspiracy theories act to diminish social trust and inhibit the desire to engage socially, although conspiracy theorists may be drawn to such theories because they already feel distrusting. Thus, Douglas et al. (2017) suggest that conspiracy beliefs may appeal to people's motivations rather than fulfill them.

Conspiracy Mentality

Somewhat distinct from conspiracy theories, conspiracy *mentality* (sometimes also referred to as conspiracy ideation) is defined as a political worldview characterized by feelings of distrust or paranoia toward government institutions, feelings of political powerlessness, political cynicism, and a defiance of authority (Einstein & Glick, 2015; Hofstadter, 1965; Jolley & Douglas, 2014). In this view, conspiracy theories are

mechanisms in which individuals make sense of a complex world, offering ostensibly logical explanations for nuanced events (Miller, 2002).

Much of the research addressing the psychological characteristics of conspiracy mentality has focused on personality or attitudinal traits (e.g., Byford, 2011; Jolley, 2013; Swami & Coles, 2010). For example, paranoia and schizotypal tendencies (Bruder et al., 2013; Darwin, Neave, & Holmes, 2011), delusional ideation (Dagnall et al., 2015), high levels of anomie and narcissism, low levels of trust, and low self-esteem (Abalakina-Paap et al., 1999; Goertzel, 1994) have been associated with conspiracy mentality. People who adopt conspiracy theories are also more susceptible to cognitive fallacies, such as overestimating the likelihood of co-occurring events. (Brotherton & French, 2014).

Swami, Chamorro-Premuzic, and Furnham, (2010) found a significant positive association between conspiracy mentality and the personality trait, *Openness to Experience* (defined by openness and intellectual curiosity, active imagination, and proclivity for novel ideas). Moreover, Openness was also positively associated with exposure to 9/11 conspiracist ideas. In these cases, there appears to be a relationship between Openness and a positive reception to unusual or unique ideas. In other words, intellectual curiosity, active imagination, and a proclivity for novel ideas may result in greater exposure to conspiracist ideas (Swami et al., 2010). These results suggest that Openness may have predictive ability in relation to conspiracy theories.

Oliver and Wood (2014) suggest that conspiracy mentality is derived from two innate psychological predispositions. The first is a tendency to see intention behind unusual events (Shermer, 1997). Research shows that this tendency is typically found in supernatural, paranormal, or religious beliefs (Boyer, 2001; Norenzayan & Hansen 2006).

The second is a desire to interpret history as a universal struggle between good and evil—and to embrace sensational narratives as descriptions of prominent events (Oliver & Wood, 2014). Similarly, Hofstadter (1965) suggested that conspiracy theories fulfill a need for narrative completion and neatness to reduce complex events to simple causes. This desire for tidy narratives (Hofstadter, 1965) that offer certainty and simplified views of the world can provide comfort and a feeling that life is more manageable.

Conspiracy mentality is often measured with questions involving a range of generic conspiracy theories, e.g., alien landings, assassinations, and secret activities of powerful organizations (see Bruder et al., 2013). A substantial body of work finds that belief in one conspiracy theory is strongly predicted by belief in other conspiracies (e.g., Bruder et al, 2013; Dagnall et al., 2015; Imhof & Lamberty, 2017; Swami et al., 2011; Wood et al., 2012). Wood et al.'s (2012) findings also suggest that conspiracy theorists are generally prone to endorse contradictory beliefs and even conflicting conspiracy theories. Thus, Imhoff and Bruder (2014) have suggested that conspiracy mentality acts as a generalized political attitude. However, it should be noted that high conspiracy mentality does not equate to belief in all conspiracies (McCloskey & Chong 1985; Uscinski, Klofstad, & Atkinson 2016; Uscinski & Parent, 2014).

Conspiracy as Skepticism

Conspiracy theorists generally express a form of reflexivity, criticism, and skepticism about truth claims (Knight, 2000; Parker, 2001). Aupers (2012) describes conspiracy theorists as combining epistemic strategies of rationalistic skepticism and spiritual belief to arrive at the truth, defying the typical distinction between the two. In a culture where the undermining of scientific authority is commonplace (e.g., climate

change denial, opposition to vaccines), where scientific findings are often retracted for fabricating or falsifying data, or misinterpreted (e.g., "A glass of red wine is the equivalent to an hour at the gym, says new study"), and where "alternative facts" such as Donald Trump's inauguration crowd are being manufactured for political gain (Bratich, 2008; Melley, 2000), conspiracy theorists' ambivalence toward modern science can be viewed as a type of reaction to epistemological insecurity (Harambam & Aupers, 2015).

Harambam and Aupers (2015) analyzed interview data from a "multi-sited ethnography" (cf. Falzon, 2012) conducted in the Netherlands from 2011 to 2014 and found that respondents (members of the Dutch "conspiracy milieu") considered themselves skeptics and critical thinkers. Conspiracy endorsers described themselves as "skeptic[al] by nature," people who "dare to think differently" and "think out of the box," as well as "put question marks over nearly everything" (Harambam & Aupers, 2015, p. 471). This skeptical attitude, or a general attitude of questioning and doubt, is often used by Flat-Earthers as a justification for denying scientific evidence. Indeed, most Flat-Earthers interviewed for this project expressed how their initial thoughts of the Flat Earth idea were that it was crazy. Many claimed to have spent their first few months trying to debunk Flat Earth "evidence," only to end up failing and eventually becoming convinced by the arguments and accepting the Flat Earth model. Testing their beliefs by subjecting them to analysis and scientific scrutiny is, in essence, the nature of scientific skepticism.

Flat Earth proponents have conducted their own experiments designed to test for the curvature of the Earth in a sincere attempt at finding "the truth." Indeed, they often say that they have no problem with "true" science and the observations and testing of the scientific method. However, that version of science, they claim, is not what we see in

mainstream society. Those we interviewed said they welcome civilized debate where they can present their evidence and mainstream scientists can present theirs.

The pervasive attitude among Flat-Earthers is that they have come to realize that they, and everyone around them, have been lied to about the true nature of the Earth. Rather than simply accepting what they are told, they consider themselves skeptical of modern science, often referring to "scientism" as a rigid belief system where debate is disallowed and fringe ideas are shunned and dismissed.

Conspiracy and Science Denial

Lewandowsky et al. (2013) analyzed possible associations between conspiracy mentality and acceptance of science and found negative relationships between the two (2013a, 2013b). However, their findings have been challenged by others who state that the data do not support their conclusions (e.g., Dixon & Jones, 2015). Landrum and Olshansky (under revision) found that conspiracy mentality predicted acceptance of fake news stories and rejection of evolution. Furthermore, they found alarmingly high percentages of people who endorse fake news relating to scientific conspiracy (e.g., Zika is caused by the GMO mosquito, GMOs cause cancer and corporations are covering it up: Landrum & Olshansky, under revision).

Objectives

The aim of the current study is to determine whether, and if so, to what extent, (a) Flat Earth ideology can be predicted by conspiracy ideation and/or religiosity, and (b) the degree to which Flat-Earthers (and other conspiracy theorists) view themselves as skeptical, logical, and rational—or suspicious, anxious, and open-minded. The first

research question focuses on identifying a motivating factor that drives Flat Earth ideology.

RQ1: *To what extent are conspiracy theorizing and religiosity associated with Flat Earth ideology?*

Based on the argument that Flat Earth ideology is partially the result of endorsement of Biblical literalism, the first hypothesis examines religiosity of Flat-Earthers.

H1a: *The Flat Earth sample will be more religious than a national sample of respondents; and,*

H1b: *Flat-Earthers are less likely to believe in evolution than the national sample.*

Based on the argument that Flat Earth ideology is more strongly associated with conspiracy theorizing, then…

H2: *Flat-Earthers will score higher on conspiracy theory endorsement (i.e., conspiracy scale score) than the national sample.*

H3: *Flat Earth beliefs will be more strongly associated with conspiracy beliefs than with religious beliefs.*

However, because Flat Earth ideology appears to heavily rely on Biblical Scripture as evidence,

H4: *Religiosity, rather than conspiracy mentality, will be the better predictor of Flat Earth beliefs.*

Because previous research has found that conspiracy theorists consider themselves as skeptical and critical thinkers (Harambam & Aupers, 2015) and since this skeptic attitude

is often used as a justification for denying scientific evidence (e.g., climate skeptics, vaccine skeptics), the following research question and hypotheses address this issue.

RQ2: *How do Flat-Earthers view themselves? Skeptical, questioning, and rational—or suspicious, anxious, and open-minded?*

H5a. *Flat-Earthers will view themselves as more skeptical than the national sample.*

H5b. *Flat-Earthers will view themselves as more rational than the national sample.*

H5c. *Flat-Earthers will view themselves as more logical than the national sample.*

CHAPTER III

METHOD

To examine these questions, data was analyzed from two samples collected as part of a broader study on alternative beliefs. Participants were asked to respond to online survey questions relating to their belief in conspiracies, their science literacy, religious and political worldviews, the shape of the Earth, and finally, how they viewed themselves. The first sample consists of 513 individuals recruited to match census data by Research Now, an online digital data collection company. The second sample consists of 23 individuals who were recruited in person at the first annual Flat Earth International Conference (more details about each sample below). In addition, 31 attendees at the conference participated in semi-structured in-depth interviews in which they were asked to expand on their beliefs. This study was pre-registered on OSF.io, an open source research and collaboration web application, prior to collecting data.

Survey Samples and Data Collection

Sample 1. The Research Now sample includes participants of an online consumer panel. Research Now uses an incentive scale based on the length of the survey and the panelists' profiles to compensate panel participants. Panel participants that are considered "time-poor/money-rich" are paid significantly higher incentives per completed survey than the average panelist so that participating is attractive enough to be perceived as worth the time investment. The incentive options allow panelists to redeem from a range of options such as gift cards, point programs, and partner products and services.

A sample was requested of 500 participants to approximate a nationally representative survey based on census numbers. A total of 513 participants were coded as

"complete." To be coded as complete, participants had to be at least 18 years old, reside in the United States, correctly answer an attention check question (i.e., "If you are reading this, choose 'likely false.'"), finish and submit the survey, and take at least 5 minutes to complete the survey. Qualifying participants (N = 513) were 56% female and ranged from 18 to 80 years old (M = 48.98, *Median* = 50, SD = 14.97). About 5% of participants reported being black or African American, 6% Asian or Asian American, and about 12% Hispanic/Latinx. The median level of education attained was an "Associate's degree" (coded to equal 14 years of school), with an average of 15.49 years of schooling (SD = 3.13).

Sample 2. The Flat Earth sample consisted of 23 individuals who attended the Flat Earth International Conference in Raleigh, North Carolina in November 2017 and agreed to be interviewed for academic research. About 50 conference attendees provided their email addresses so they could receive a link to a follow-up survey. Of the 23 individuals who completed the survey, 10 were male, seven were female, and six declined to provide their gender. Most of the participants were White, but one reported being Black, one reported being Hispanic/Latinx, and three declined to report their race/ethnicity. Education levels varied, with three reporting a high school diploma, four reporting some college, one reporting having a two-year degree, seven reporting a bachelor's degree, and two reporting graduate degrees. Six declined to report their education level. The average age of this group was 37.59 years (*Median* = 35, SD = 13.21), though six declined to provide information on age.

Sample 3. In-depth interviews were conducted with 30 different individuals who attended the Flat Earth International Conference. Interviewees were given $10 Amazon

gift cards for participating. Interviews were recorded and consent to be recorded was received for each interview. Average interview length was 20 minutes. Of the 31 interviews, 29 were fully transcribed, and two recordings were lost due to quality. Seven interviewees were female and 24 were males. Most participants were White, two reported being black, one Hispanic, and one Asian (Indian). The average age of this group was 41.30 years (*Median* = 43, *SD* = 10.66), though three declined to provide their age.

Data collection. All participants were emailed a link to the survey, which was hosted on Qualtrics.com. The survey included questions on science curiosity, science intelligence, cultural cognition, criteria for belief, perceptions of self, and demographics. The median time taken to complete the survey was 17.62 minutes. The items used in this study are described below.

Measures

Conspiracy mentality. A modified version of Bruder and Manstead's (2009) Conspiracy Theory Questionnaire (CTQ) was used to measure conspiracy mentality. Nine items were included on the scale based on their difficulty and discriminatory power from an item response theory analysis (Cronbach's alpha = .75). These items included prototypical conspiracies (e.g., the Apollo program never landed on the moon) and recent ones (e.g., Obama was not born in the U.S.). Participants were asked to rate each item on a 4-point scale (1 = definitely false, 2 = likely false, 3 = likely true, 4 = definitely true). On average, the Research Now sample rated these items around "likely false" (*M* = 2.28, *SD* = 0.47) and the Flat Earth sample rated the items around "likely true" (*M* = 3.21, *SD* = 0.47). A graded response model will be used to calculate participants' scores then center them.

Science literacy. A shortened version of the Ordinary Science Intelligence (OSI 2.0) scale by Kahan (2017; see also Kahan et al., 2012) was used to measure scientific literacy. This shortened version includes six items that were chosen based on their difficulty and discriminatory power using item response theory (Cronbach's alpha = .71). This scale included the true or false statement, "Human beings, as we know them today, evolved from earlier species of animals." This item was used to measure belief in evolution between the two samples.

Items were scored so that correct answers received 1 point and incorrect answers (and no response) received 0 points. On average, participants answered 2.54 questions out of 6 correctly (*SD* = 1.57, *Median* = 2). Consistent with prior research, the scale will be evaluated and scored using a two-parameter model from item response theory (2PL).[3] Scores will then be centered so that the average score will be 0.

Religious worldviews. People's values and worldviews are enormously influential in their acceptance or rejection of science, and therefore, we also asked about religiosity and political affiliation. Participants' religiosity was assessed by asking how much guidance faith or religion provide in their daily lives (0 = not religious, 1 = none at all, 2 = a little, 3 = a moderate amount, 4 = a lot, 5 = a great deal). For both the Flat Earth and Research Now sample, the median level of religiosity was 3—a "moderate amount" (Flat Earth *M* = 2.81, *SD* = 1.97; *Research Now*: *M* = 2.61, *SD* = 1.69).

Flat Earth beliefs. Flat Earth beliefs were assessed by asking participants to rate a series of three statements on a 4-point scale (1 = definitely false, 2 = likely false, 3 = likely true, 4 = definitely true). These included "The Earth is flat and not a globe," "The

[3] Two parameters include location (item difficulty or success level) and discrimination (degree that the item differentiates between individuals in different locations on the latent continuum.

Arctic Circle is in the center of the earth, and "Antarctica is a 150-foot tall wall of ice surrounding the rim," and "Gravity does not exist; instead, there is a force called 'universal acceleration' that produces identical effects as observed from the surface of the Earth" (Cronbach's alpha = .61). These statements were drawn from flat earth views that are discussed on the Flat Earth Society webpage.

Perceptions of self. To explore how participants viewed themselves, we asked them to rate a list of adjectives (e.g., skeptical, rational, logical) on how well the words described them individually. Each quality was measured on a 5-point scale (1 = not very well at all, 2 = slightly well, 3 = moderately well, 4 = very well, 5 = extremely well). Adjectives used for this study were "Skeptical" ($M = 3.37$, $SD = 1$), "Rational" ($M = 3.92$, $SD = 0.9$), and "Logical" ($M = 4.0$, $SD = 0.86$).

CHAPTER IV

RESULTS

H1a: Comparing the two samples on religiosity

To test the first hypothesis, that the FE sample would have a higher religiosity score than the RN sample, an independent samples *t*-test was run where religiosity was numeric, and sample was a binary factor. Analysis shows that there is no significant difference in religiosity between the average religiosity of the flat earthers ($M = 3.0$, SD = 0.98) compared to the RN sample ($M = 2.61$, SD = 0.99), $t(14.68) = 0.79$, $p = 0.444$.

H1b: Comparing the two samples on belief in evolution

Hypothesis 1b predicted that the Flat Earth sample would be less likely to believe in evolution than the national sample. Logistic regression analysis predicting the probability of rejecting evolution from sample found no significant difference between the two samples. This is presumably because of the small Flat Earth sample size; indeed, whereas only 31.5% of the Research Now sample said they did not believe in human evolution, 100% of the Flat Earth sample rejected it.

H2: Comparing the two samples on conspiracy endorsement

Hypothesis 2 predicted that Flat-Earthers would score higher on conspiracy endorsement than the national sample. To measure this, first a *t*-test (conspiracy scale ~ Group) was run. Then, an ANCOVA was run, where conspiracy scale was the DV, sample was the grouping factor, and the following demographics were controlled for: age, gender, Hispanic, Black, and education. Independent samples *t*-test suggests a significant difference between the two samples on conspiracy theory endorsement, with

the Flat Earth sample scoring higher ($M = 3.37$) than the national sample ($M = 2.29$), $t(22.50) = 14.66$, $p < .001$. After controlling for demographics, there was still an effect of sample $F(1, 506) = 69.03$, $p < .001$. See table 1.

Table 1. Results from regression analysis predicting conspiracy mentality. Type III sums of squares used, thus effects are after controlling for the other variables in the model.

Effect	Coefficient	Type III SS	df	*F*	*p*	
Sample (1 = Flat Earthers)	-0.94	12.48	1	69.03	< .001	***
Age	-0.01	6.40	1	35.41	< .001	***
Black	-0.09	0.20	1	1.12	.290	
Hispanic	0.08	0.31	1	1.74	.188	
Education	-0.05	2.26	1	12.51	< .001	***
Female	0.07	0.60	1	3.33	.069	^{t}
Religiosity	0.02	0.78	1	4.30	.039	*
Science Literacy	-0.12	3.00	1	16.60	< .001	***
Residuals		91.51	506			

H3: Predicting Flat Earth beliefs

Hypothesis 3 stated that Flat Earth beliefs would be more strongly associated with religious beliefs than with conspiracy beliefs. An index of Flat Earth beliefs was created by averaging responses to the flat earth views: "The Earth is flat and not a globe," "The Arctic Circle is in the center of the earth, and Antarctica is a 150-foot tall wall of ice surrounding the rim," and "Gravity does not exist and instead, there is a force called "universal acceleration" that produces identical effects as observed from the surface of the earth." The scores ranged from 1 to 4, with 4 indicating stronger flat earth views (Flat Earth sample: $M = 2.95$, SD = 0.37; RN sample: $M = 1.41$, SD=0.48). Regression analysis was conducted, predicting Flat Earth beliefs from sample, conspiracy mentality, religiosity, and demographics (i.e., age, gender, race, ethnicity, and education). Most of the variables predicted Flat Earth beliefs. See Table 2.

Table 2. Results from regression analysis predicting flat earth beliefs. Type III sums of squares used, thus effects are after controlling for the other variables in the model.

Effect	Coefficient	Type III SS	*df*	*F*	*p*	
Sample (1= Flat Earthers)	0.78	5.75	1	23.75	< 0.001	***
Age	0.00	0.32	1	1.33	0.249	***
Black	-0.15	0.41	1	1.68	0.196	***
Hispanic	0.20	1.57	1	6.49	0.011	
Education	-0.05	1.95	1	8.06	0.005	
Female	0.10	1.08	1	4.45	0.036	***
Religiosity	0.01	0.05	1	0.19	0.666	
Conspiracy Mentality	0.29	6.45	1	26.66	< 0.001	
Science Literacy	-0.25	12.10	1	49.98	< 0.001	***
Residuals		*105.80*	*437*			

Furthermore, a test of relative importance (Gromping, 2006; Lindeman, Merenda, & Gold, 1980) examined each individual variable's independent contribution to the model by averaging the sequential sums of squares over all of the different orderings of the variables (Lindeman et al., 1980). This test suggests that the model explained 37.92% of the total response variance (variance = 0.38), and 10.2% is accounted for by conspiracy mentality, whereas religiosity only accounted for 0.9%. Also more important than religiosity was education, which accounted for 4.6% percent of the total response variance. See Figure 2.

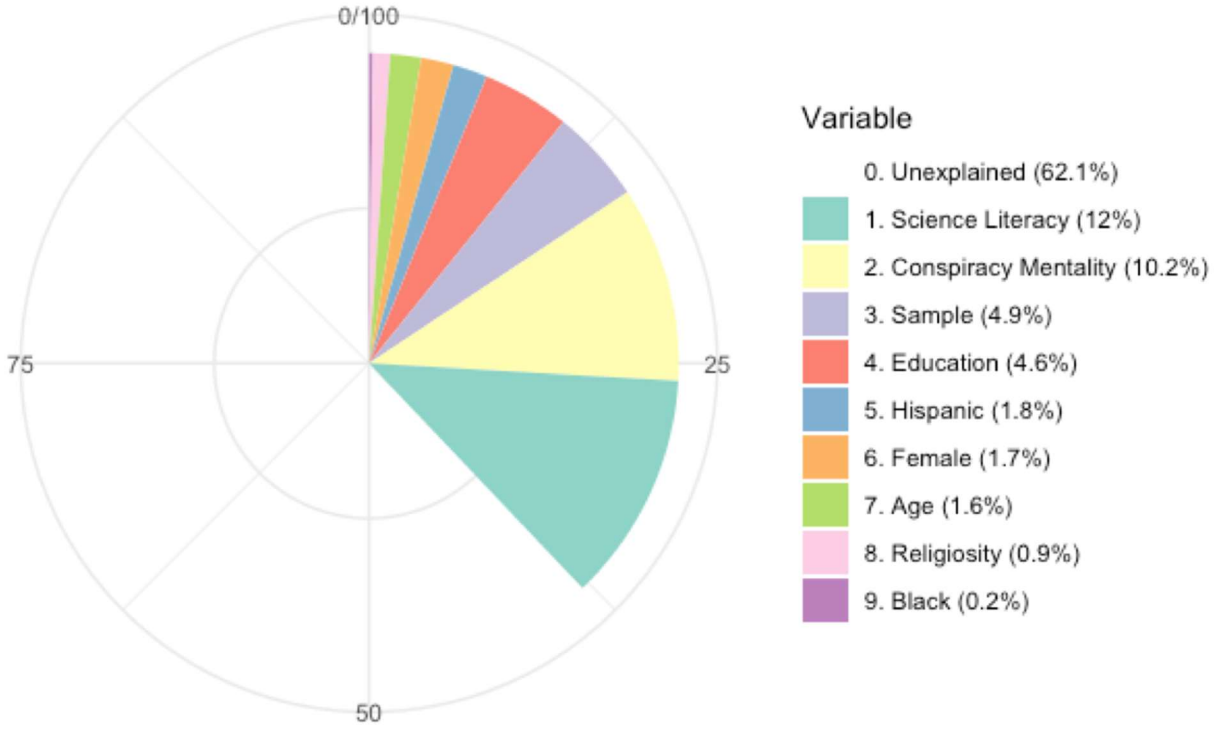

Figure 2. Relative importance for each variable. Sample and conspiracy beliefs explain the largest amount of variance.

H4a. Comparing the two samples on how skeptical they view themselves

The second research question focuses on how participants view themselves. Hypothesis 4a predicted that Flat-Earthers would view themselves as more skeptical than the national sample. Independent samples *t*-test suggests significant difference between the two samples on how skeptical they viewed themselves, with the Flat Earth sample scoring higher ($M = 4.19$) than the national sample ($M = 3.34$), $t(15.98) = 3.39$, $p = .004$.

H4b. Comparing the two samples on how rational they view themselves

Hypothesis 4b predicted that Flat-Earthers would view themselves as more rational than the national sample. Analysis shows that there is no significant difference in

how rational the Flat Earth sample viewed themselves ($M = 4.25$) and how the national sample viewed themselves ($M = 3.91$), $t(16.32) = 1.73$, $p = 0.10$.

H4c. Comparing the two samples on how logical they view themselves

Hypothesis 4c predicted that Flat-Earthers would view themselves as more logical than the national sample. Independent samples *t*-test suggests that there is significant difference between the two samples on how logical they view themselves, with the Flat Earth sample scoring higher ($M = 4.44$) than the national sample ($M = 3.99$, $t(16.83) = 2.78$, $p = .01$).

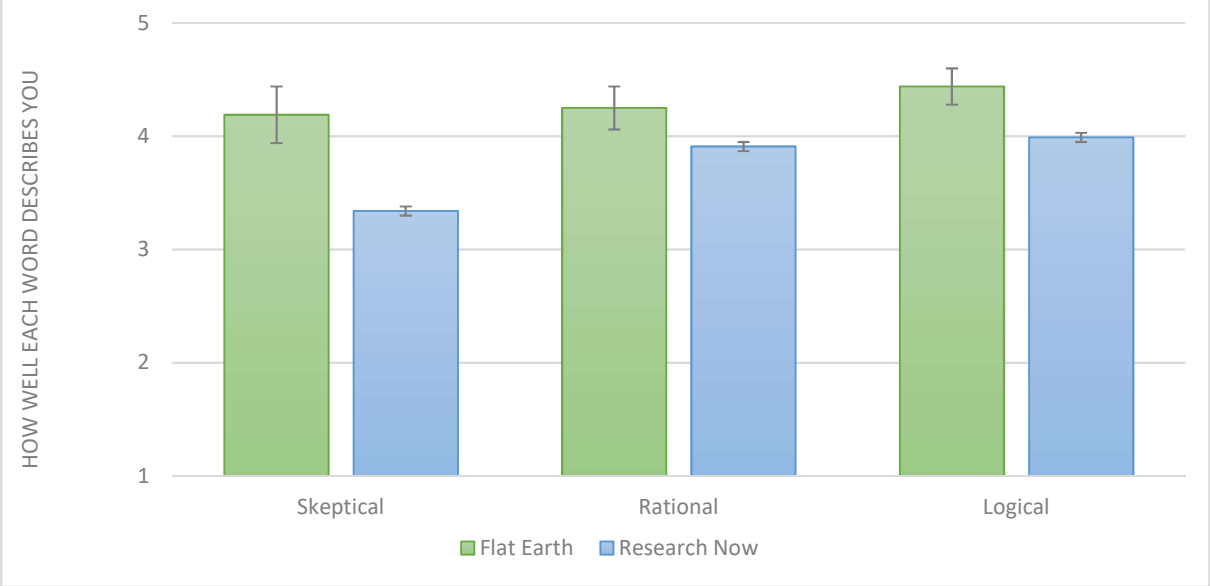

Figure 3. How well each word describes you. For the RN sample, the mean score for 'Skeptical' was 3.34 ($SE = 0.04$) and the FE sample mean score was 4.19 ($SE = 0.25$). For the 'Rational,' the mean score for the RN sample was 3.91 ($SE = 0.04$) and the FE sample mean was 4.25 ($SE = 0.19$). For the RN sample, the mean score for 'Logical' was 3.99 ($SE = 0.04$) and the FE sample mean score was 4.44 ($SE = 0.16$).

Interviews

Interview recordings were transcribed, and each was analyzed to validate the accuracy of transcription. In order to maintain anonymity, to begin each interview, a combination of letters and numbers (e.g., AB001) were assigned to each participant, and they were given the option to be referred to by that moniker or by a pseudonym of their choice throughout the interview. Using Strauss and Corbin's (1990) grounded theory for guidance with the analysis of the transcripts, several emerging themes were identified.

Conspiracies Abound

Consistent with prior research indicating that those who endorse one conspiracy theory will likely endorse others (e.g., Bruder et al, 2013; Dagnall et al., 2015; Imhof & Lamberty, 2017; Swami et al., 2011; Wood et al., 2012), the majority of Flat-Earthers interviewed also believed in other conspiracies. Each conference attendee interviewed mentioned that they had come to endorse Flat Earth beliefs within three years of the conference, predominantly after watching Flat Earth videos on YouTube. Two suggested that they first heard about Flat Earth through word-of-mouth. Many had also mentioned watching other conspiracy videos on YouTube (e.g., 9/11 conspiracy videos) and then Flat Earth videos would appear in their recommended videos feed. As one respondent expressed when asked when and how he came to believe the Earth was flat:

> "*Within the past couple years and it came out of, uh, watching YouTube - I mean, like, I'm gonna pinpoint it for you. YouTube. Okay. I was watching, uh, just conspiracy theories, maybe 911, or this or that, and I loved it. I, you know, I didn't care if it was true or not - I just thought it was better than television. I*

> *thought it was good TV and I'm watching it on TV - Um, it's good television. Some of these documentaries are compelling - Um, and I didn't pay much ... I didn't care if the government really did 911 or not, but I enjoyed it and you know, YouTube, if you like stay with like conspiracy stuff, they'll throw flat Earth in your, uh, you know, suggestions. And I watched it just like I would watch any movie, TV show, or whatever, just as you know mind-numbing just activity*" (AB036).

Likewise, when asked if there were other conspiracies that he accepted, another participant responded:

> "*Uh, yeah, I mean, if ... I mean, I'm not a really big fan of the term, conspiracy theory, not to say that we, you know, we know it all, but conspiracy theories are the ones that are not proven. We're labeled as conspiracy theorists when we have all the evidence, but, just to answer your question, the conspiracies that I focus on are, um, Darwinian evolution. You know, lack of any proof of that. Flat Earth is a big one. You know, I was big on 9/11, I've delved into Sandy Hook a little bit. Paul McCartney's dead conspiracy*" (AB015).

Indeed, many people were introduced to Flat Earth theories through YouTube: after watching other conspiracy videos, the site's algorithms lead to suggestions of more conspiracy videos, which included those about Flat Earth. Furthermore, as suggested above, the appeal of conspiracy theories may originate as a form of entertainment, before ultimately becoming convinced of certain theories.

Disbelief vs Belief

A noteworthy component to notion of "believing in" any particular conspiracy is that many of those who were interviewed, expressed more of a disbelief in the "official" version of the truth rather than necessarily accepting one conspiracy or another. Despite the persistent depictions of the Earth as a flat disk in the Flat Earth community, many Flat-Earthers expressed uncertainty about the actual shape of the Earth, however, they were adamant that it was not the commonly depicted 'spinning ball.' When asked to describe the shape of the Earth, one conference attendee replied,

> "*The shape of the Earth, I think, for me, personally, is I would take a Biblical point of view on it, taking a literal view on it. And I would say that it's not a ... we're not on a spinning ball, flying through space. Exactly what shape it is, I'm not sure. And I wouldn't say that I know a hundred percent. It's all about that quest to discover it and figure it out*" (AB004).

One interviewee echoed this sentiment when he was asked to describe the shape of the Earth,

> "*That is an interesting idea because all I know is that the places I've been to are flat. And I know, and I can tell that we're not moving at a higher rate of speed. But I don't know besides that*" (AB008).

In a similar tone, when asked to describe the shape of the Earth, another participant had this to say,

> "*Well, I don't know at this point in time, because I used to think it was a globe, I used to think it spun, I used to think all those things that everyone thought. That*

> *everyone was taught. I was taught. But, what I've noticed through all the experimentation, different people have done, and through reading some of the ancient, some of the older experiments ... There's the Michelson - Morley experiment, there's um, there's quite a few different evidences out there that the Earth is some sort of flat-ish thing. Maybe like a record, I, I'm assuming it's still possibly round. I'm assuming it's round, I don't know. Um, but not a spherical, not a spinning globe*" (AB005).

Therefore, contrary to interpretations of prior research indicating that conspiracy theorists are prone to endorse conflicting conspiracy theories (Wood et al., 2012), it may simply be that they find each conflicting theory to be more plausible than the "official story."

Evidence or Lack Thereof

Another common theme emerging from the interviews was the use of similar expressions of "proofs" for the Earth's true shape. For example, the fact that nobody can sense the motion of the earth, for them, is a red flag. Furthermore, the phrase "water doesn't curve," is repeatedly used to express the idea that the oceans should not be able to curve with the shape of the Earth. One participant explained this concept when asked the primary reason he believed the Earth was flat:

> "*Uh, I actually have this written on the side of my van. Uh, it's a quick three ... three sentence phrase. It's uh, 71% of the Earth's surface is water, and you can get that figure from Google. If you type in Google "What percentage of the Earth's surface is water?" They'll tell you about 72%. And um, the second part of that is bodies of water do not curve. And I just have to believe that because*

> *everywhere else that I look, water lays flat. If it's in a glass of water, if it's in a bathtub, pool, puddle on the side of the road, a lake when you go fishing. You know, I go out ... I, I was out on the Atlantic Oceans a few ... a couple months ago and panned my camera phone right to left, and it was all flat, for miles and miles. So that's ... that's the biggest thing, it's water in my opinion, is the dead giveaway. You know, because water, water doesn't ... it doesn't bow, it doesn't bend around anything and you can't ... you can't duplicate that in a laboratory, which is what science is supposed to be, it's supposed to be repeatable, testable. But they tell us that gravity is what keeps trillions of tons of water to the bottom of a spinning ball but like, you can't test that in a lab*" (AB018).

Similarly, many of the Flat-Earthers at the conference claim that an individual can see farther than they're supposed to if the Earth was a sphere. One conference attendee describes it this way:

> "*There appears to be I would say an overwhelming proof that all of this independent research um, showing that the Earth uh, that we, we're able to see things at a really far distance that we should not be able to see if it was curved. So people are you know, using really impressive new technology like the, the famous P900 camera that they can't keep in stock because all the Flat-Earthers using it, 'cause the lens on it is just so powerful that it's able to see a few hundred miles into the horizon* (AB007)."

He then reiterated how he trusts his own senses to discern the truth,

> "*I research, I follow all the research that other people are doing. Um, and I vet my information by seeing what they're doing, but I have the belief that the optics that I need are my own eyes. So I'm able to see the entire profile of the Presidential Mountain Range in central New Hampshire 70 miles away from downtown Portland, Maine. And to me, that's my initial proof that I was appearing to look over and across a flat plain as the crow flies of 70 miles, which using their math and their circular trigonometry and their 8" drop squared per mile math that the institutionalized you know, mainstream peer-reviewed science gives us, I should only be able to see 4000 or 2000 feet of that 6000 foot mountain, I should only be able to see the top third of it basically, and I'm literally seeing the entire profile 70 miles away. Which to me is, is compelling proof that it appears that I'm looking over and across the flat plain*" (AB007).

As indicated by the above quotes, Flat-Earthers rely primarily on their senses and their own reasoning to arrive at the true nature of reality. If they can't feel the Earth's orbit, it must not be moving. Similarly, if they can't see the curvature of the Earth, it must not be round.

NASA Lies

All Flat-Earthers ultimately and necessarily believe that NASA, as an institution, is lying about the space program. To explain how tens of thousands of NASA employees have been able to keep this secret for several decades, they often invoke compartmentalization as a means of keeping the real objective of the organization from those not in the upper echelons or 'in the know.' One participant, when asked if he believed NASA was lying about the space program, responded this way:

> "*Yeah, but I don't believe that's intent- that they're doing it ... um, that the people who are doing the projects are intentionally trying to fool us. I think it's just how it's presented. Like it's so compartmentalized that they don't know what they're doing and they may ... I mean they sign secrecy forms and so once you sign those forms, I mean, you're basically signing all your rights away to come out and say things*" (AB030).

When asked if he believed if the images NASA produces of the Earth are fake, another participant responded:

> "*I do believe that. But, again, it's irrespective whether I believe that to be true, or if it's true or not. If I can prove that they lied about one thing, what's to say that they didn't lie about everything*" (AB015)?

Evident from the above quotes is that to maintain belief in a Flat Earth, one must also believe that NASA is lying about the space program. What is unclear is whether the belief in Flat Earth motivates beliefs that NASA is lying, or vice versa. Because NASA has been shown to lie before, they lose credibility, and therefore are not to be trusted. Conversely, some Flat-Earthers may begin with belief in a Flat Earth and then employ motivated reasoning to conclude that NASA must be lying. Thus, the direction of causation is unknown.

Biblical Literalism

Lastly and crucially, 18 of the 31 Flat-Earthers interviewed referred to Biblical scriptures as support for the shape of the Earth, including references to the firmament

dome structure over the Earth. For example, when asked the primary reason he believes the Earth is flat, one participant said,

> "*I based it- it's on Genesis. The Genesis is- the Bible is true. I believe everything in the Bible, and- and so that just fits that last little piece into it. It just ma- it makes- the Bible is true. The Bible's never been proved false. In fact, it's been proved truer and truer as people start digging up things out of the Earth and everything, so. It's the Bible*" (AB039).

Similarly, when asked her primary reason for believing the Earth was flat, she answered simply,

> "*The Bible*" (AB040).

She further described how she first heard about Flat Earth ideas,

> "*I just heard word it was flat. I went to the Bible and asked God, and uh, started searching in the Book. And the Bible revealed 100 verses*" (AB040).

Another interviewee had this to say when asked why he believed the Earth was flat,

> "*Really because of, um, the Bible. You know, looking through the filter of scriptures, it really talks about a flat, motionless Earth*" (AB033).

Therefore, it appears that Biblical literalism does indeed play a role in Flat Earth beliefs. Although widespread among this group, not all Flat-Earthers are Biblical literalists. Thus, while the Biblical literalism is pivotal for many Flat-Earthers, it is not necessary to believe in Flat Earth.

CHAPTER V

DISCUSSION

This study set out to determine whether, and if so, to what extent, (a) Biblical literalism and conspiracy ideation predict belief that the Earth is flat, and (b) the degree to which Flat-Earthers (and other conspiracy theorists) view themselves as skeptical, logical, and rational—or suspicious, anxious, and open-minded. Findings indicate that while there was no significant difference in religiosity between the Flat Earth sample and the national sample, the Flat Earth sample was, however, significantly higher in conspiracy mentality. This finding suggests that religiosity, and by extension, Biblical literalism, may not be as motivating a factor as previously thought. Furthermore, education proved to explain more of the response variance for Flat Earth beliefs than religiosity. While religiosity or Biblical literalism, in and of themselves, are not good predictors of Flat Earth beliefs, high religiosity combined with high conspiracy mentality, could be. Afterall, it seems unreasonable to assume that most Biblical literalists would accept a Flat Earth model.

From the interview analysis it was determined that most, if not all, Flat-Earthers also endorse other conspiracy theories. Also consistent among all Flat-Earthers who were interviewed was the belief that NASA, and by extension the US government, has not been honest with the public about the true nature of their activities. This is in line with prior research that demonstrated high levels of mistrust of authority among those with high conspiracy mentality (Einstein & Glick, 2015; Hofstadter, 1965; Jolley & Douglas, 2014). Because they believe that authorities are not trustworthy, Flat Earthers cannot be persuaded to believe that the Earth is a globe by any pictures or evidence collected by NASA. Images from space are perceived to be “photoshopped” or otherwise

manipulated. Flat-Earthers also do not believe that we have landed on the moon. Because they cannot trust evidence from authorities, some Flat-Earthers are earnestly working to raise money to build their own rockets to fly to space and their own ships to sail to Antarctica with the hope of finding evidence to support their beliefs.

Moreover, for many of the Flat Earthers we interviewed, first-hand perceptions or staunch empiricism should be trusted first and foremost. The Earth, from their perspective, looks flat, it doesn't feel like it's moving, and everything in the universe appears to be orbiting the Earth. In fact, many claim to be able to see farther than what would be expected on a spherical Earth.

It was also gathered from the interviews that YouTube played a significant role for introducing and eventually converting many Flat-Earthers. Indeed, YouTube appears to be the glue of the Flat-Earth community. Many of the interviewees said that they were eager to meet and speak with their favorite YouTube personalities and that many of the 'expert' panelists and speakers at the conference were hosts of their own YouTube shows. These individuals gathered their evidence for the Flat Earth theory from conspiracy documentaries about NASA to four-hour-long documentaries on the "evidence" for a Flat Earth, all found on YouTube. YouTube was unanimously described by the interviewees as a reliable and unrestricted source of visual evidence-based material produced by individual truth-seekers, rather than mainstream science and scientists. YouTube was even cited among the most popular sources for unbiased news, since the mainstream media are perceived as having their own angles and therefore cannot be trusted.

Biblical literalism and high religiosity were also abundantly evident from analysis of interview transcripts. This finding is somewhat inconsistent with the survey results indicating that Flat Earthers were not significantly more religious than the national sample. This raises concerns about how questions examining religiosity among conspiracy theorists are posed. Indeed, when asked about their religiosity during interviews, many participants suggested that they were not religious, but that they prefer seeing themselves as having a personal relationship with God, and that faith was a "major guiding factor in their lives." Religiosity, to them, implies association with an organized church, which is antithetical to their anti-authoritative worldview. In other words, interviewees did hold religious beliefs and values, but do not like the idea of affiliating with an institutional religion or church. Moreover, no one that was interviewed described themselves as an atheist; after all, as Robbie Davidson, organizer and speaker, said to sweeping applause at the International Flat Earth Conference, "There are no atheists in Flat Earth."

There does, however, appear to be a minority among the Flat Earthers who don't appreciate the Biblical overtones and feel that associating Flat Earth with the Bible, only makes a further mockery of an otherwise serious scientific inquiry. One boisterous Flat Earth proponent female YouTube personality was even escorted out of the conference after raising questions and subsequently her voice, about why God and the Bible need to be tied to Flat Earth. There are also others who are simply conspiracy theorists, admittedly so, who find the idea of Flat Earth fascinating and compelling.

Interestingly, despite the intensity with which speakers at the conference and many Flat-Earthers described their mental model of the Earth, their descriptions also

included language demonstrating curiosity, inquisitiveness, and skepticism. For many Flat-Earthers, the true shape of the Earth was less important than denying the "official version." In other words, Flat-Earthers are highly skeptical of authority and therefore question the legitimacy of established facts or versions of events. Participants that were interviewed conceded that they were not certain about the shape of the Earth, saying, for example, "we don't really know because we can't explore it, but this is what the Bible says."

Thus, this study also analyzed how Flat-Earthers view themselves. Skepticism can often be worn as a badge of honor or used in a derogatory way when describing science deniers. Scientists often pride themselves in their ability to apply skepticism to most truth-claims. Interestingly, Flat-Earthers, too, see themselves as skeptics. Many of the variables associated with conspiracy ideation in past research focus on psychological factors such as paranoia (Bruder, Haffke, Neave, Nouripanah, & Imhoff, 2013), delusion (Dagnall, Drinkwater, Parker, Denovan, & Parton, 2015), a tendency to engage in cognitive fallacies (Brotherton & French, 2014), and reduced analytic thinking (Swami, Voracek, Stieger, Tran, & Furnham, 2014). However, consistent with prior research findings by Harambam and Aupers (2015) that conspiracy theorists consider themselves as skeptical and critical thinkers, results here also indicate that Flat-Earthers do consider themselves more skeptical and logical than the national sample. Results from this study indicated no significant difference in how rational the two samples viewed themselves. This suggests that Flat-Earthers see themselves as no less rational than a national sample. While outsiders may assume that conspiracy theorists are simply not thinking logically, they see themselves as the logical ones. Future research should continue to test these

hypotheses with larger samples of individuals with Flat Earth beliefs or strong conspiracy mentalities.

Psychology and communication literature have repeatedly shown that people are motivated reasoners (Kunda, 1990). We quickly accept information that fits our values and prior beliefs (e.g., confirmation bias), and carefully scrutinize and find reasons to diminish or reject evidence that challenges them. Though many intuit that the real problem is one of knowledge: "if we just improved science literacy, then more people would 'accept' what science knows," this is just not the case. People are motivated to resolve the cognitive dissonance that they face when new or existing information conflicts with their own values. They often do this not by adjusting their deeply held worldviews or values systems, but by rejecting the conflicting information. Thus, it stands to reason that Flat-Earths would accept this flat model of the Earth (rejecting the globe model), when you take into consideration what their worldviews are.

Conclusions and Limitations

The primary goal of this study was to examine the extent to which Flat Earth beliefs are associated with conspiracy and religious beliefs, and to determine whether Flat-Earthers view themselves as more skeptical, logical, and rational—or suspicious, anxious, and open-minded than those who do not accept the ideology. This work sought insights into the relationships between individual differences and belief outcomes and to contribute to the existing literature.

This study is exploratory in nature and includes several limitations. First, the Flat Earth sample is small. However, obtaining data from individuals with conspiratorial mindsets is especially difficult given their mistrust of academia and their general

unwillingness to complete surveys. To further this research, additional data collections are tentatively planned for upcoming Flat Earth conventions. Secondly, the Flat Earth sample who did complete the survey may not be representative of the Flat Earth community as a whole, considering that individuals with high conspiracy mentality are probably less likely to provide their information, especially online, than the Flat-Earthers who did. For religiosity, only one question was utilized, whereas a scale was used to determine conspiracy beliefs. In future research, a religiosity scale should be utilized. The analysis will be contextualized with reference to these limitations.

Future research should seek to further understand the process of discovery and subsequent conversion to Flat Earth beliefs. Insights into the types of arguments or evidence put forth by Flat Earth YouTube videos which are perceived as the most credible or convincing, will also be valuable for identifying key aspects of the conversion process. Furthermore, future research into Flat Earth ideology should be more thoroughly based on theory.

From all accounts, Flat Earth ideology appears to encompass a merging of Young Earth Creationism and conspiracy theory (e.g., anger about NASA lying). As one conference attendee mentioned when asked if the Bible should be interpreted literally, "Yes, almost all of it is meant to be literal. And now I can take more of it literally as a Flat-Earther, which is satisfying." Furthermore, most conference attendees interviewed mentioned becoming aware of Flat Earth ideas through YouTube within the last few years.

It seems increasingly plausible that in the age of YouTube and in the wake of 9/11, Biblical literalists with a penchant for conspiracy ideation, who began as consumers

of 9/11 conspiracy videos, were steered toward other conspiracy videos, including flat Earth videos, as a result of YouTube's algorithms. Indeed, in a recent attempt at curbing the spread of conspiracies on its cite, YouTube has chosen to link to text-based cites, such as Wikipedia, rather than adjusting its algorithms. Time will tell if this has any effect on the growth of the flat Earth movement.

It is also possible, as results from this study suggest, that Biblical literalism plays only a small role in accepting the Flat Earth model. While many, if not most, of the International Flat Earth Conference attendees, and certainly the conference organizer and many of the speakers, are indeed Biblical literalists, it is possible that most Flat-Earthers do not necessarily take this approach. Instead, they may become convinced of Flat Earth ideas through "scientific" and conspiratorial arguments, applying Biblical scripture only as support, if at all. One conference attendee described the Flat Earth Conference gathering this way; "This group represents maybe ¾ of the Flat Earth community; there's way more Christians here than in the whole Flat Earth world." "I find that we have a lot of Christians who are willing to look at conspiracy theories, that become Flat-Earthers. And it's not hard to convince a Christian to be a Flat-Earther."

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Appendix. Survey Questions

Religiosity
How much guidance does faith or religion provide in your day-to-day life?
0. I'm not religious
1. None at all
2. A little
3. A moderate amount
4. A lot
5. A great deal
10. I choose not to answer

Flat Earth Beliefs
For each of the items below, please indicate whether you think each of the following statements is true or false. Remember, that there are no right or wrong answers and we are interested in your personal opinion.
1 Definitely false
2 Likely false
3 Likely true
4 Definitely true
9 I prefer not to answer

Earth is flat and not a globe.
The Arctic Circle is in the center of the earth, and Antarctica is a 150-foot tall wall of ice surrounding the rim.
Gravity does not exist. Instead, there is a force called "universal acceleration" that produces identical effects as observed from the surface of the earth.

Belief in Evolution
True or False: Human beings, as we know them today, evolved from earlier species of animals.
0 False
1 True
9 I prefer not to answer

Conspiracy Theories
For each of the items below, please indicate whether you think each of the following statements is true or false. Remember, that there are no right or wrong answers and we are interested in your personal opinion.
1 Definitely false
2 Likely false
3 Likely true
4 Definitely true
9 I prefer not to answer

1. Politicians usually do not tell us the true motives for their decisions.
2. Governments have deliberately spread HIV amongst minorities.
3. A cure for most types of cancer has already been found, but medical circles prefer to keep getting research funding from governments and keep their findings secret.
4. U.S. government agencies were involved in the assassination of Martin Luther King, Jr.
5. Better alternative energy options have already been developed, but oil and gas companies have prevented them from being used commercially.
6. President Barack Obama was not born in the United States.
7. The Apollo space program never landed on the moon.
8. Subliminal advertising (ads being shown so fast that we do not notice them) exists and influences people to a large extent.
9. The government can find out how I voted in elections.

Ordinary Science Intelligence
True or False: Antibiotics kill viruses as well as bacteria.
0 False**
1 True
9 I prefer not to answer

Which gas makes up most of the Earth's atmosphere?
1 Nitrogen**
2 Hydrogen
3 Carbon Dioxide
4 Oxygen
9 I prefer not to answer

How long does it take the earth to go around the sun?
1 1 year**
2 1 month
3 1 day
9 I prefer not to answer

Here are three word-problems that vary in difficulty. Answer as many of them as you can.
Imagine that we roll a fair, six-sided die 1,000 times. Out of the 1,000 rolls, about how many times do you think the die will come up as an even number?
Ans: 500
In the Acme Publishing Sweepstakes, the chance of winning a car is 1 in 1,000. What percent of tickets of Acme Publishing Sweepstakes will a car?
Ans: 0.1%
In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how many days would it take for the patch to cover half of the lake?
Ans: 47 days

Perceptions of Self
How well do each of the terms describe you?
1. Not well at all
2. Slightly well
3. Moderately well
4. Very well
5. Extremely well

skeptical
logical
rational

Demographics
How old are you? (in years)

Which best reflects your gender?
1. Male
2. Female
3. Other (please specify)
9. I choose not to answer

Which best describes your race/ethnicity? Please check all that apply.
1. White/Caucasian
2. Black or African American
3. Hispanic or Latino
4. Asian/Asian-American
5. Native American/Alaska Native
6. Native Hawaiian/Pacific Islander
7. Other (please specify)
9. I choose not to answer

What is the last grade you completed in school (or highest level of training completed)?
1. Grade 8 or lower
2. Some high school, no diploma
3. High school diploma, or equivalent
4. Some college, no degree
5. Associates, Technical college, or two-year college degree
6. Bachelors or four-year college degree
7. Graduate or professional school
9. I choose not to answer