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Folk Epistemology of Factual, Political, and Religious Beliefs

by

John Christner

A dissertation presented to  
The Graduate School  
of Washington University in  
partial fulfillment of the  
requirements for the degree  
of Doctor of Philosophy

May 2017

St. Louis, Missouri

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## ABSTRACT OF THE DISSERTATION

Folk Epistemology of Factual, Political, and Religious Beliefs

by

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Doctor of Philosophy in Psychological & Brain Sciences

Washington University in St. Louis, 2017

Professor Leonard Green, Chair

The term “folk” refers to the intuitive – as opposed to the academic – version of a discipline (e.g., folk physics). The present series of seven studies explored folk epistemology, that is, how laypeople intuitively think about their own knowledge. Concepts from academic epistemology were investigated in laypeople. In addition, folk epistemology across three domains of knowledge were compared: religious, political, and factual.

Studies consisted of two parts. In Part 1, participants were presented with religious, political, and factual statements and asked how certain they were that each statement was true. In Part 2, participants were re-presented with only statements that they had rated as very certainly true in Part 1. For each statement presented in Part 2, participants were asked to reflect on epistemological concepts related to how/why they believed the statement to be true. Studies 1 and 2 helped to validate the research materials. Studies 3 and 4 investigated the extent to which laypeople use and value verification and falsification, respectively, across the three domains. Study 5 examined theories of truth – do laypeople define the truth of religious, political, and factual beliefs based on correspondence, coherence, or pragmatism? Study 6 explored objectivity – do laypeople feel their beliefs are objectively true? Study 7 explored several

concepts related to overall certainty and nature of belief, including the required effort to believe, frequency of doubt, and obviousness and reasonableness of truth. Participants also were asked how they would react to those who disagreed with them and to counterarguments as another window into the nature of their beliefs.

Results showed that (i) folk epistemology differed systematically across the three domains; (ii) intuitions about factual knowledge were more closely related to normative, academic standards; and (iii) intuitions about religious and political knowledge were strikingly different from normative standards. That is to say, religious and political beliefs were regarded as less verifiable, less falsifiable, less consistent with other true propositions, more dubious, less reasonable, and more subjective.

These results suggest that current conceptions of why/how people believe propositions to be “true” insufficiently describe belief in the political and religious domains. Truth determination is neither domain-general, nor does it rely exclusively on propositional content. Laypeople appear to be less certain that religious and political propositions accurately track reality. Exactly which factors motivate belief in these domains is still not fully understood.

## **Chapter 1: Introduction**

How do people think about the nature of truth, knowledge, and belief? For centuries, questions about the acquisition and definition of knowledge were of concern only to philosophers (Dancy, 1985). Epistemology (the academic discipline) explores many aspects of human knowledge – how we justify our beliefs, define truth, and acquire knowledge (Honderich, 2005). It is the task of philosophers to establish normative standards and principles with which to conceptualize knowledge. Recently, however, behavioral scientists have approached the investigation of knowledge in another way, focusing not on the normative project of academic epistemology, but rather on describing “folk epistemology” – intuitive theories and principles that laypeople actually use when thinking about their own knowledge. This area of research may be referred to as personal epistemology, folk epistemology, or simply epistemics (“folk epistemology” will be used henceforth).

Folk epistemology is of interest to psychologists because it relates to many aspects of human life – how we make decisions, form beliefs, learn, and commit to various propositions. Major questions in the field revolve around how laypeople evaluate different sources of knowledge. For example, are some people to be more believed than others, and why (Hofer & Pintrich, 1997)? Is knowledge considered absolute or relative (Goodwin & Darley, 2008)? That is, can different people’s perspectives be both true and contradictory at the same time? Other questions pertain to the issue of how people justify their knowledge. For example, is the subjective feeling of “certainty” the result of *analytic reasoning*, or is the feeling of certainty generated by relatively heuristic processes (Buehl, Alexander, & Murphy, 2002)? Important

questions arise, too, over developmental issues. For example, at what age do children's attitudes about truth and certainty change (Kuhn, Cheney, & Weinstock, 2000)? Finally, differences in folk epistemology may depend on the particular domain of knowledge being considered. For example, do people have a subjective sense that the facts learned about math and science are more "objectively true" than is the case for social studies (Hofer, 2000)? Answering questions like these helps us to understand how children learn, why conflicts over certain propositions persist while others easily resolve, the nuances of the intuitive definition of "true," and much more.

## **1.1 Goals of the Current Research**

The purposes of the present series of studies are twofold: firstly, to investigate theories and principles from academic epistemology in laypeople. To what extent do laypeople rely on the same ideas that philosophers use when they think intuitively about their own knowledge? In order to answer this question, I present participants with straightforward, factual propositions – that is, statements that refer to observable states of the world – and ask them to reflect on how and why they believe these propositions to be true. More specifically, I ask if they rely on various ideas from epistemology that have not yet been explored in laypeople (e.g., verification, falsification, theories of truth, etc.).

The second purpose is to investigate hypothesized folk epistemological differences in two previously underexplored domains of knowledge, specifically, the religious and the political. In order to create a comparison to straightforward factual knowledge, I also ask people about religious and political propositions that they believe to be true. As will be discussed in greater detail below, the folk epistemology of religious and political propositions is fascinating for three

reasons: (i) previous research on intuitions about knowledge in these domains is sparse; (ii) many propositions in these domains violate principles from normative epistemology; and (iii) belief in these domains is accompanied by social costs and benefits, thereby creating a unique motivational landscape with respect to belief.

In sum, the current research examines normative epistemological concepts as well as other interesting ideas related to intuitions about knowledge in laypeople. Many of these concepts have not yet been investigated. In order to explore “default,” or most common folk epistemology, participants are asked about factual beliefs. In addition, the current research simultaneously searches for domain specific, folk epistemological differences by asking participants about religious and political beliefs.

## **1.2 Philosophical Background and History of Folk Epistemology**

Before considering the rationale and design of the present studies in more detail, it is important to provide a brief overview of the relevant philosophical terminology and a tour of previous research in folk epistemology. These discussions provide a better understanding of concepts that will be examined in the present studies and popular methodological approaches and topics of interest in the field.

### **1.2.1 Epistemological Theories and Principles**

The present set of studies asks laypeople about principles/theories from philosophy. These ideas relate primarily to justification (the process of determining what is true) and truth (the nature, or defining characteristics of being true). What follows is a brief review of those concepts from philosophy that are relevant to the current research.

## Justification

Which ideas from academic epistemology do laypeople intuitively use, if any, when justifying their beliefs? Is intuitive justification different for “fact-based” beliefs compared to religious beliefs? In philosophy, the major theory of justification is *evidentialism*, which, simply put, states that justification of a conclusion depends on the evidence for it. In cases where evidence does not exist, then the conclusion or belief is deemed unjustified, untrue, and cannot be “known.” As Hume put it, “A wise man. . . proportions his belief to the evidence” (Hume & Beauchamp, 2000, p. 56). Evidentialism has been supported by many influential philosophers and remains the dominant theory of justification today.

An opposing theory of justification is *fideism*. Fideism is “exclusive or basic reliance upon faith alone, accompanied by a consequent disparagement of reason and utilized especially in the pursuit of philosophical or religious truth” (Plantinga, 1983, p. 87). Fideism is invoked primarily in the philosophy of religion. Ideas supporting fideism date back as far as earliest thinkers in the Catholic church, but the term was not coined until the 19<sup>th</sup> century (Amesbury, 2016).

Evidentialism is the sole theory of justification in modern science and is considered normative in epistemology. Two influential ideas born out of philosophy that remain standard in the scientific approach to achieving justification through evidence are verification and falsification. Grounded in the empiricist tradition, the logical positivist movement of the 1920s originally argued that for a statement to be even cognitively meaningful (and therefore true or knowable), it must be verifiable (Ayer, 2012). Later, Karl Popper argued that falsification was more useful for testing hypotheses about truth. According to Popper, the strongest hypothesis

must posit some observable state of the world that could prove it to be false, thereby enabling it to be tested. If researchers attempt but fail to falsify a hypothesis, then it is believed to be more true (Popper, 2005).

### **Theories of Truth**

When considering their own beliefs, do laypeople define truth like philosophers do? Does the intuitive definition of truth change across domains of knowledge (religious, factual, political)? Whereas justification describes a process for arriving at truth, truth itself is a description of the nature of a proposition. Three major theories of truth, in order of popularity, are the correspondence, coherence, and pragmatic theories (Kirkham, 1992).

*Correspondence.* Correspondence theory states that a proposition is true to the extent that it corresponds to a state of the world. Any reliance on reality as a source for substantiating facts could be said to fall under correspondence theory. This approach to defining truth dates back to Aristotle, but influential thinkers like Bertrand Russell have supported and discussed the theory more formally (Russell & Eames, 1984). An example of correspondence would be the statement, “Koalas are in Australia.” The statement is true because the state of the world is such that koalas are in Australia. The state of the world is not true or false itself, rather, it simply is. If the proposition corresponds to that state of the world, then the proposition is true. Correspondence theory works well for propositions that are linked to observable or at least theoretically detectable states of the world. Critics complain that the theory is circular or vacuous because in order to determine if a statement corresponds to a state of the world accurately, the state of the world would need be determined in the first place. Thus, there would need to be some ontological theory already in place that would accomplish any function purportedly derived from



correspondence theory (Williams, 1999). Despite these criticisms, correspondence theory remains dominant among philosophers for defining the nature of truth.

***Coherence.*** The most influential competing theory of truth to correspondence is coherence theory. Coherence theory states that propositions are true to the extent that they cohere with other established propositions, forming a mutually corroborating system of beliefs like a web. This theory is often attributed to the scholars in the idealism school of thought which construes reality as mentally constructed rather than existing independent of the mind (Walker, 1989). Because of this metaphysical position, idealists like Kant found coherence more compelling than correspondence, which refers to an external reality. Coherence theory often provides support for truth alongside correspondence because beliefs that cohere with one another may fit together as part of a theory that ultimately rests on correspondence with the world (e.g., physical evidence that fits together to convict a murder suspect). But coherence theory is uniquely well-suited to explain instances of truth in which correspondence can be unclear, such as in the case of mathematical proofs.

***Pragmatic.*** The pragmatic theory of truth, often attributed to William James, rejects the idea that truth depends on principles like correspondence or coherence. Instead, truth arises from how well a proposition functions for some *purpose* relative to its alternatives (Kirkham, 1992). The pragmatic theory is sometimes used to understand the provisional truth of scientific claims that function to explain phenomena and are always vulnerable to substitution for a better-functioning explanation. The present research explores the possibility that among laypeople, the pragmatic theory may be used for ethical or religious truths that lack both correspondence and

coherence, but are believed to function well for the good of society (e.g., “The world would be a better place if everyone believed in God”).

### **Summary of Epistemological Concepts**

Evidentialism is the prominent theory of justification whereby a proposition is considered justified insofar as there is evidence for it. Under evidentialism, verification and falsification remain popular tools for navigating evidence to confirm or disconfirm hypotheses. Fideism is the idea that truth can be directly known through faith and does not require justification. It is often used in religious contexts.

Three theories of truth prominent among philosophers are relevant to the present series of studies. Correspondence refers to a relationship between a statement and the world. According to correspondence theory, a statement is true when it accurately describes a state of the world. Coherence refers to the relationship between true statements. According to coherence theory, a statement is true when it is consistent with other true statements. Pragmatic refers to the functionality of a statement for a given purpose. According to pragmatic theory, a statement is true when its consequences are most useful for accomplishing a goal.

### **1.2.2 Psychological Research on Folk Epistemology**

Although the present research does not involve children or developmental issues, much of the previous research in folk epistemology has been conducted by developmental psychologists. In addition, developmental psychologists generated many of the early questions and theories that organized the field of folk epistemology. What follows is a brief review of the historical roots and foundational contributions that remain relevant today. This review is meant to familiarize the reader with the field of folk epistemology, popular methods, and types of

questions scholars have pursued previously – all of which are relevant to the present set of studies.

Jean Piaget was one of the earliest scientists to study folk epistemology. His theory, called “genetic epistemology,” set out to understand the origins and development of human knowledge. According to Piaget, humans pass through four developmental stages: sensorimotor (0-2 years old), preoperational (3-7 years old), concrete operations (8-11 years old), and formal operations (12 and beyond). Each stage signifies a progression in intelligence and reasoning abilities from mere motor skills to complex thought about abstract concepts and deductive reasoning (Piaget, 1950).

Piaget’s approach motivated developmental psychologists to become pioneers in the study of folk epistemology. Many followed his view by theorizing about the development of epistemological features as a progression of stages. Kohlberg’s classic studies on the development of morality investigated how children justify their knowledge and reason about moral judgments throughout six stages (Kohlberg, 1971, 1976, 1981). Perry (1970) posited stages of epistemological growth, focusing on adolescence into college years, in which young people shifted from an absolutist to a more relativist understanding of truth.

Over the years, much of the developmental psychological theorizing and research fell under the umbrella term “personal epistemology” (for reviews of various theories of personal epistemology, see Hofer, 2001; Hofer & Pintrich, 1997). As personal epistemology evolved as a field, scholars sought to standardize terminology and unify related ideas about developmental stages into a common framework. Kuhn et al. (2000) offered a unification of existing stage

theories and investigated the source of knowledge, the subjectivity of knowledge, and how intuitions vary across domains.

Kuhn et al. (2000) asked 5<sup>th</sup>, 8<sup>th</sup>, and 12<sup>th</sup> graders, and adults to evaluate disagreements between “Robin” and “Chris” by reading statements about what Robin versus Chris believed. For example, Robin believed one mathematician's proof of a math formula whereas Chris believed a second mathematician's proof of the same math formula. Participants evaluated disagreements in several different domains of knowledge including social facts, physical facts, personal tastes, and social conventions. After being told about each disagreement, participants were asked if only one person could be right or if both people could be at least partially correct. If the participant responded that both people could be right, then a follow-up question was asked: “Can one view be more right?”

Kuhn et al. (2000) interpreted an answer that only one view could be right as “absolutist” whereas a response that both views could have some rightness was labeled “multiplist.” If the participant thought one view could have more merit, they then were labeled “evaluativist” (see Table 1, which displays a summary of Kuhn’s theory). Although there was a large variety in the patterns of responses, Kuhn et al. interpreted the results as showing a progression through the stages from absolutist to multiplist to evaluativist. This pattern was consistent across different domains of knowledge like tastes, facts, and social conventions.

Table 1  
Developmental stages of epistemological understanding (cf. Kuhn et al. 2000)

Stage	Assertions	Reality	Knowledge	Critical thinking
Realist	Assertions are COPIES of an external reality.	Reality is directly knowable.	Knowledge comes from an external source and is certain.	Critical thinking is unnecessary.
Absolutist	Assertions are FACTS that are correct or incorrect in their representation of reality (possibility of false belief).	Reality is directly knowable.	Knowledge comes from an external source and is certain.	Critical thinking is a vehicle for comparing assertions to reality and determining their truth or falsehood.
Multiplist	Assertions are OPINIONS freely chosen by and accountable only to their owners.	Reality is not directly knowable.	Knowledge is generated by human minds and is uncertain.	Critical thinking is irrelevant.
Evaluativist	Assertions are JUDGMENTS that can be evaluated and compared according to criteria of argument and evidence.	Reality is not directly knowable.	Knowledge is generated by human minds and is uncertain.	Critical thinking is valued as a vehicle that promotes sound assertions and enhances understanding.

### Summary of Developmental Psychological Contributions

The research questions, methods, and Kuhn et al.'s (2000) stage theory all exemplify the foundational contributions to folk epistemology research from developmental psychologists and personal epistemology. The source of knowledge, certainty, structure, objectivity, and domain generality versus specificity all became topics of continued exploration. Asking people to evaluate assertions, beliefs, and disagreements became frequently used methods of accessing intuitions about knowledge. The present research borrows from several of these contributions, but focuses on previously understudied domains of knowledge in adult participants.

## **The Domain Specificity/Generality Debate**

One question first raised by developmental psychologists that remains relevant today is whether folk epistemology is domain specific or general – that is, are laypeople’s intuitions about knowledge different depending on the domain of knowledge? Early on, many scholars interested primarily in human development focused on stages and patterns of folk epistemological changes that occurred reliably over the lifespan at certain ages. These thinkers parsed differences in folk epistemology according to stage rather than domain. However, evidence for domain specificity has accumulated.

Hofer (2000) administered questionnaires to first-year undergraduate psychology students. Participants were asked to respond on a scale from 1-5, indicating the extent to which they agreed with statements designed to investigate four aspects of folk epistemology: certainty of knowledge, simplicity of knowledge, source of knowledge, and justification for knowing. For example, statements included, “In this field, today’s facts may be tomorrow’s fiction;” “In this field, the only thing uncertain is uncertainty itself;” and “In this field, most words have one clear meaning” (Hofer, 2000, p. 388). One questionnaire was labeled “Psychology” at the top while another was labeled “Science” (which referred to “hard sciences”). Results showed four major differences between folk epistemology in psychology versus science. Participants responded that scientific knowledge was more certain, attainable, and derived from authority than psychological knowledge. However, personal experience was said to be a greater source of justification in psychology. Hofer concluded that discipline-focused epistemological beliefs existed.

Buehl et al. (2002) also used questionnaires administered to undergraduates, and compared students’ folk epistemology with respect to history versus math. Students were asked

to rate the extent to which they agreed with statements like, “Ideas in math/history are related to each other,” or “History/math is unrelated to day-to-day life.” Buehl et al. found that students viewed mathematical knowledge as more difficult to attain and more integrated with other knowledge.

Wainryb, Shaw, Langley, Cottam, and Lewis (2004) used imaginary disagreements as a way to elicit children’s (ages 5, 7, and 9) beliefs about subjectivity and justification of knowledge and tolerance of opposing viewpoints. Four domains were studied: Morality (“It is okay to hit and kick others”), facts (“Rain is dry”), tastes (“Chocolate ice cream tastes yucky”) and ambiguous facts (“The dog isn’t eating because it isn’t hungry”). Ninety-six participants, 32 at each age level, were first asked if they agreed with the statement and then were told about two imaginary characters who held opposing viewpoints (one character held the same belief as the participant and one held the opposing belief). Participants were then asked about subjectivity (is it possible for both characters to be right or only one?) and tolerance (is it acceptable for someone to have an opposing viewpoint to yours?). If the participant said “no” to the tolerance question then justification was tested (why is it not acceptable for someone to have an opposing viewpoint to yours?).

Participants responded to the subjectivity and tolerance questions with a “yes/no” response and to the justification question by explaining their reasons as to why it was unacceptable for others to hold opposing beliefs. For the justification question, the researchers coded participants’ responses for statements like, “I don’t agree with this person because her belief would cause harm/isn’t true/is subjective/isn’t fair/is incomplete.” Results showed that children became slightly more subjective and tolerant with age. But the much stronger effect was

from domain. Fewer than 10% of children were subjective or tolerant of opposing moral or factual beliefs whereas over 50% of children were subjective and tolerant of opposing beliefs in the ambiguous fact and taste domains. These findings supported the argument for domain specificity.

Responses about justification also were domain specific. Almost 100% of participants referred to concerns about welfare and fairness when explaining why opposing moral beliefs were unacceptable (“Kicking other kids is mean because it hurts them, so what that kid said is just wrong, very wrong”). In the factual domain nearly 100% discussed concerns about what was observably true (“If she goed outside she’d see that rain is always wet, so her belief is all wrong”). Tastes were most frequently said to be subjective (“People have their own tastes, so both beliefs are right actually”) and children most often expressed concern at the difficulty of verifying ambiguous facts (“It’s not like we can ask the dog if he’s hungry, so maybe this kid is right and the other kid is right too”).

### **A Close Examination of the Goodwin and Darley (2008) Paradigm**

Research on adults also has shown domain specificity. As will become apparent, the present work was inspired, in large part, by a general methodological approach taken by Goodwin and Darley (2008). The primary goal of that research was to assess whether participants felt their belief was subjective/relative as opposed to objective/absolute across different domains. It is thus useful to consider their methodology and results in some detail.

Goodwin and Darley (2008) examined laypeople’s intuitions about objectivity with respect to four content domains. One domain pertained to *factual beliefs* (e.g., Boston [MA] is further north than Los Angeles [CA]). A second domain pertained to *moral precepts* (e.g.,



robbing a bank in order to pay for an expensive holiday is a morally bad action). A third domain pertained to *social conventions* (e.g., Wearing pajamas and a bath robe to a seminar meeting is wrong behavior), and a fourth pertained to *personal tastes* (e.g., Frank Sinatra was a better singer than is Michael Bolton). The study was divided into two stages.

**Stage 1:** In the first stage, participants rated the extent to which they *personally agreed* with various propositions in the different domains on a scale ranging from 1 (strongly disagree) to 6 (strongly agree). For each statement, after rating their agreement level, participants also categorized the statement as *true, false, or opinion*.

**Stage 2:** In Stage 2, participants were presented with two ethical, one factual, one social convention, and one personal taste statement from Stage 1. Critically, in Stage 2, participants were presented *only* with statements from Stage 1 with which they had highly agreed or disagreed. That is, participants were presented with statements that they had rated either 1 or 2 (indicating strong disagreement) or that they had rated either 5 or 6 (indicating strong agreement). For each statement that was presented in Stage 2, participants were (i) told that someone else in the study had disagreed with them about the statement and, based on this supposition, the participants were (ii) asked to select an option that best represented how they felt about that disagreement. Participants were given four choices to characterize how they felt about this disagreement: (1) *The other person is surely mistaken*; (2) *It is possible that neither you nor the other person is mistaken*, (3) *It could be that you are mistaken, and the other person is correct* or (4) *Other*.

Some clarification and elaboration on the aforementioned scales is worth noting here. Choices 1 and 2 capture whether participants feel the truth of the statement is objective versus

subjective. Choice 1 was meant to capture objectivity. If a participant thought that anyone who disagreed with them was surely mistaken, then that participant must have believed that their own, exclusive understanding of the truth was absolute. However, choice 2 was meant to capture subjectivity. If a participant thought that it was possible that neither party was mistaken, then they must have thought that different versions of the truth were acceptable, or that truth was relative. Choice 3 also was meant to capture objectivity. If the truth is objective, then that means only one version can be correct. In the event that the participant was mistaken, that would mean that the disagreeing other would have to be correct. Choice 4 was meant to capture all other subjective cases where it is possible for someone to disagree, and yet neither party be mistaken.

Goodwin and Darley (2008) then created a measure of objectivity by combining the responses to the categorization question in Stage 1 with the responses to the subjectivity/objectivity question in Stage 2. This measure of objectivity had three levels: fully objective, intermediately objective, and least objective. The most objective response, termed “fully objective,” was defined as when the participant considered a particular statement true (or false) in Stage 1 and considered one who disagreed as surely mistaken in Stage 2. Fully objective was scored as a 3. “Intermediately objective” could result from a participant considering a particular statement true (or false) in Stage 1 but not seeing either party as surely mistaken in the case of disagreement in Stage 2. Alternatively, intermediately objective could result from a participant considering a statement to be an opinion in Stage 1, but feeling that anyone who disagreed was surely mistaken in Stage 2. Intermediately objective was scored as a 2. Finally, the least objective was defined as when a participant considered a statement to be an opinion in

Stage 1, and then didn't regard anyone as surely mistaken in the case of a disagreement in Stage 2. Least objective was scored as a 1.

For example, suppose that a participant categorized the statement, "Frank Sinatra is a better singer than Michael Bolton" as true/false in Stage 1, and then indicated that the disagreeing other was "surely mistaken" in Stage 2. These responses, taken together, would represent a "fully objective" belief and be scored a 3. If another participant categorized the statement as true/false in Stage 1, but allowed for the possibility that the disagreeing other was not mistaken in Stage 2, then these responses would represent an "intermediately objective" belief and be scored a 2. If a participant categorized the statement as an opinion in Stage 1 and then allowed for the possibility that the disagreeing other was not mistaken in Stage 2, then these responses would represent the "least objective" belief, and be scored a 1.

Goodwin and Darley (2008) predicted that across factual, ethical, social convention, and taste statements, they would see a trend from most objective to least objective responses. Based on results using the three-point scale, their prediction was confirmed. Mean objectivity ratings were 2.91, 2.56, 2.00, and 1.56 for factual, ethical, social convention, and taste statements, respectively. ANOVA results confirmed a highly significant difference among all domain comparisons. Later, in a similar follow-up study, Goodwin and Darley (2012) showed that beliefs about negatively valenced moral acts (stealing a wallet) are seen as even more objective than beliefs about positively valenced acts (donating income). In addition, Goodwin and Darley (2012) asked participants to report the percentage of the population that they thought would agree with each statement. The reported level of expected agreement predicted objectivity ratings among participants. In other words, when participants predicted that most or all members of the

population would agree about a statement, they were more likely to feel that the particular statement was objectively true.

Goodwin and Darley (2008) inspired the methodology used in the current set of studies. Similarly, the present set of studies seeks to describe people's understanding of features of their own knowledge, with a focus on religious and political versus factual beliefs. Like Goodwin and Darley, I first ask participants what they believe, but critically, follow up with questions about the nature of those beliefs.

### **Summary of Domain Specificity Debate**

The historical roots in developmental psychology focused folk epistemological research on domain-general developmental trends. Patterns of folk epistemological development undeniably exist, but domain-specific aspects cannot be ignored. Muis, Bendixen, and Haerle (2006) conducted a review of 19 studies revolving around folk epistemology. The studies included within- and between-participant designs, and tested children and adults. Furthermore, the studies looked at a wide range of epistemological concepts, including the structure of knowledge, certainty of knowledge, sources of knowledge, and justifications for knowing. Muis et al. (2006) found that 17 of the 19 studies provided clear support for domain specificity. The remaining two showed moderate support for a domain-general model.

Evidence for domain specificity in folk epistemology is clear, but the field still needs theoretical cohesion with respect to which domains of knowledge are of interest, and why. Some researchers are interested in different academic disciplines, hoping to inform the educational process, whereas others follow early theorists in parsing knowledge into moral beliefs, facts, and social conventions. Amidst the conversation surrounding domain specificity in folk

epistemology, one area of knowledge has been (perhaps surprisingly) underexplored, namely ideological beliefs. Religious belief has long occupied a unique niche in philosophical history, yet few psychologists have examined how laypeople think about their own religious knowledge. Similarly, the folk epistemology of political beliefs has not been directly studied.

### **General Summary of the Background Literature**

Folk epistemology is a field founded and formulated by developmental psychologists. These early thinkers developed methods and areas of interest that remain prominent today. The present research follows their lead by continuing to investigate the sources of knowledge, justification, certainty, objectivity of knowledge, tolerance of disagreement, and domain-specific intuitions about knowledge. Despite decades of research in folk epistemology, several major ideas from academic epistemology remain untested in laypeople. Theories of truth and justification have not yet been fully examined. The present research asks to what extent laypeople use these ideas when thinking about their own knowledge. Evidence for domain specificity in folk epistemology has been found in many previous studies, but understanding which domain differences are most interesting, and why they exist, remains an open project. Investigating two domains that have fascinating folk epistemological differences is a major goal of the present research. It is with this goal in mind that I consider why religious and political beliefs are of interest.

### **1.3 Why Are Religious and Political Beliefs Interesting?**

Several factors motivated the study of folk epistemology of religious and political beliefs. In addition to being historically underexplored, these domains embody fascinating and mysterious epistemological features, making them ideal candidates for investigation. For

example, many religious beliefs violate normative epistemological standards. That is, religious beliefs often are unverifiable, unfalsifiable, not based on evidence, and may not correspond to any state of the world or cohere with other propositions that the believer has determined to be true. Our intuitive epistemological standards also are violated by religious propositions.

According to Boyer (2001), religious beliefs are by definition *counterintuitive* in the sense that they violate our folk ontological systems for understanding the world. Consider a belief that a spirit can walk through a solid wall. This proposition violates our folk physics which tells us that normally, objects cannot move through one another. In this sense, religious beliefs are automatically represented as strange and fantastic, even to those who believe them to be true.

Another interesting feature is that religious propositions are often considered to be obviously false by all, except those who believe them. For example, some Appalachian churches in the United States believe that bites from venomous snakes are harmless to believers (Hood & Williamson, 2008). This belief is demonstrably false, evidenced by the hospitalization and even death of snakebite victims. How do believers intuitively think about the truth of a proposition that is so obviously false to everyone else? Even large, organized traditions make claims that non-believers unhesitatingly find to be totally unconvincing. Put another way, we are all atheists with respect to every god except our own (Dawkins, 2016). How are religious propositions obviously false to some and simultaneously true to others?

Political beliefs are similar in some ways to religious beliefs in that they do not rely on normative epistemological standards of justification and truth. For instance, political groups have established platforms of beliefs without theoretical connections from one belief to the next (lacking coherence). Believers may support theoretically conflicting positions, for example,

being “pro-life” when it comes to abortions, and simultaneously in favor of the death penalty (Kahan, 1999).

Significantly, the believer’s group membership in a politically relevant group predicts belief more than the content of the proposition. For example, Cohen (2003) asked Republican and Democrat participants how they felt about welfare. Cohen found that Democrats favored a relatively “generous” version of this policy compared to Republicans. That is, Democrats tended to support awarding recipients more money compared to Republicans. Participants then were assigned to one of four conditions in which they read about a proposed welfare policy. Cohen varied the amount of benefits recipients would receive, namely \$800 (“generous”) versus \$200 (“stringent”) per month. Cohen also varied whether participants were told that Republicans or Democrats supported the policy. Results showed that participants overwhelmingly supported the policies that their own political group approved of, independent of whether the policy was generous or stringent. In a follow-up experiment, participants were even shown the proposed policies side by side with information that Republicans/Democrats supported the generous/stringent policy, respectively. Even when all information about both possible policies was available, participants still preferred the policy that their group supported. In addition, when asked, participants reported that their group affiliation did not influence their decision whatsoever, and that their determination was based purely on an impartial consideration of the facts. Interestingly, participants were certain that the group affiliation did influence decisions made by their political opponents. In particular, Democrats denied that partisanship played a role in their own judgments, even while asserting that such bias played a role in the judgments made by Republicans, and Republican participants showed the mirror image of this effect. In short,

participants believed that their own judgments were unbiased, but that judgments made by others were biased. These findings demonstrate both the departure from normative epistemological standards of justification and the significance of group affiliation in forming political beliefs.

When considering other political issues such as gun control or affirmative action, therefore, these findings suggest that people will be biased in terms of how they process arguments and evidence. Opposing arguments are subjected to extreme skepticism whereas supporting arguments are accepted with little scrutiny. When people are allowed to choose how to direct their own time and attention, they do not attempt to falsify their political beliefs and instead focus on seeking confirmatory evidence (Taber, Cann, & Kucsova, 2009; Taber & Lodge, 2006). The departure from unbiased evidentialism in evaluating political policies suggests the possibility of fascinating underlying folk epistemology in the political domain.

In addition to religious and political beliefs not adhering to epistemological principles, these beliefs also influence a variety of social consequences including friendships, mating opportunities, social status, political leadership, and intergroup conflict. In turn, these effects mean that even if the contents of the religious or political propositions do not impact the world (e.g., doing a rain dance may not actually cause rain), there are nevertheless real costs and benefits associated with belief/disbelief (e.g., believing that a rain dance causes rain may have an impact on social bonding). Conversely, other domains have no social consequences. For example, people are not concerned about others' beliefs about the viscosity of water or the wavelength of light. This difference in social consequences, between religious and political beliefs on the one hand and factual beliefs on the other, motivates the comparison of folk epistemology across these domains.



Examples of the social consequences of religious and political beliefs can be seen all around us, but they have also been found in the laboratory. Members of religious groups and political parties disproportionately behave altruistically toward one another and harmfully toward outgroups. Bulbulia and Mahoney (2008) found that in a modified Dictator Game, Christian dictators gave more benefits to Christian compared to non-Christian recipients. Moreover, in a key condition, recipients were given the opportunity to incur a cost in order to reduce the payoff to other participants in the experiment. Christian recipients who chose to incur a cost in order to reduce the payoff to non-Christians were rewarded the most by Christian dictators.

People show a preference to not associate with members of outgroup religious traditions (Haidt, Rosenberg, & Hom, 2003). The world over, religion motivates intergroup conflict, and battles are sometimes fought over the most minor religious disagreements (Harris, 2005). Religious and political affiliations also influence people's mating markets; they determine who is a potential mate, and what courting and mating behaviors are acceptable (Kurzban, Dukes, & Weeden, 2010; Li, Cohen, Weeden, & Kenrick, 2010).

For better or for worse, political and religious belief is used to determine coalition affiliation and to make assumptions about the believer. In one of the few folk epistemological studies looking at ideological beliefs, 8- to 10-year-old participants were asked to consider four types of belief statements: true facts, religious beliefs, untrue facts, and opinions. The participants were asked if the belief statement revealed more information about the world in general or about the believer. Religious beliefs, opinions, and untrue facts were said to offer more information about the believer whereas true factual beliefs revealed more about the world (Heiphetz, Spelke, Harris, & Banaji, 2014).

## **1.4 Summary of Motivation for the Current Research**

The study of folk epistemology has illuminated several features of human intuitions about knowledge, but several academic epistemological concepts remain unexplored in laypeople. The current research aims to determine the extent to which laypeople think about or rely on these concepts when forming their own beliefs. The folk epistemology of religious and political beliefs has also been underexplored. These domains are particularly fascinating because of a number of features suggestive of unique folk epistemology. These beliefs depart from normative epistemological standards, are obviously false to many, are the result of biased reasoning processes, and influence social consequences. All of these reasons motivate the investigation of academic and other epistemological concepts, comparing the religious and political domains to the factual domain.

## **1.5 Outline of Studies**

In a series of seven studies, the current research aims to answer several questions, all of which revolve around the folk epistemology of beliefs within three domains: religious, political, and factual. In order to investigate the questions of interest, all of the studies asked participants to reflect on statements that they believed to be true. There were three types of statements: religious (e.g., Jesus walked on water without sinking), political (e.g., A powerful military is necessary to protect American interests), and factual (e.g., A square has four right angles). The major goals are to examine academic epistemological principles in laypeople and to explore whether domain-specific differences exist in the folk epistemology of religious and political versus factual beliefs. Below, I briefly summarize the questions and goals of each study to provide an outline of the research. Specific hypotheses, methods, results, and conclusions,

however, are explained later. It is important to keep in mind that the first two investigations, Studies 1 and 2, represent “table-setting” studies, intended to provide the foundation for the remaining five studies.

### **Study 1**

The goal of the first study was to show that participants could reliably sort the target statements into one of three categories (i.e., “religious,” “political,” and “factual”). This goal was important, in order to verify that each of the statements clearly conveyed its intended meaning and implication with respect to the three categories in question.

### **Study 2**

Study 2 had two goals. The first goal was to validate the statements that would be used in Studies 3-7. In order to ensure that religious and political statements had the intended meaning to participants, it was important to demonstrate a correlation between belief that these statements were true and accepted measures of religiosity and political orientation. Study 2 also explored how people think about resolving uncertainty. Is uncertainty more difficult to resolve in the political and religious domains than in the factual domain?

### **Study 3**

Study 3 explored the epistemological concept of verification. Do people think their religious, political, and factual beliefs are verifiable? Do they think evidence and verification are the best ways to establish truth? The goal of Study 3 was to investigate how laypeople rely on verification when determining truth across different domains.

### **Study 4**

Study 4 explored the epistemological concept of falsification. Do people think their religious, political, and factual beliefs are falsifiable? Do they think evidence and falsification are the best ways to establish truth? The goal of Study 4 was to investigate how laypeople rely on falsification when determining truth across different domains.

### **Study 5**

Study 5 explored academic theories of truth in laypeople. In particular, the goal of Study 5 was to investigate how laypeople use academic conceptions of truth and justification, and also to demonstrate differences across domains of knowledge. Study 5 included questions like: When considering why religious, political, and factual beliefs are true, which theory of truth do people rely on – correspondence, coherence, or pragmatic? To what extent do people rely on trust in the testimony of others or faith? How important is indoctrination from a young age for forming beliefs in the religious, political, and factual domains?

### **Study 6**

Study 6 explored the concept of objectivity and tolerance for opposing beliefs in others. The primary goals were to investigate the extent to which people feel their beliefs are objectively versus subjectively true, and to determine if there are differences across domains. Study 6 also explored how people tolerate disagreement.

### **Study 7**

Study 7 looked beyond academic concepts and explored various intuitions about knowledge related to truth and certainty. The goal of Study 7 was to evaluate whether religious and political beliefs violate not only academic standards but also intuitive standards of truth and justification. Study 7 explored several aspects of certainty and belief, including how much effort

is required to believe, how obvious and reasonable propositions are, if people doubt their beliefs, and about the distinction between “knowing” versus “believing.” Furthermore, Study 7 examined people’s reactions to counterarguments across the three domains.

## **1.6 A Note on the Sampling Technique Used in the Present Research**

Participants for all studies were recruited from Amazon’s Mechanical Turk (MTurk.com), a website where businesses or individuals, known as “requesters,” can post tasks for individuals, known as “workers,” to complete in exchange for money. The tasks, referred to as “Human Intelligence Tasks” (HITs), require human intelligence because equivalent machine intelligence is either unavailable or too costly to develop. For example, a typical HIT might involve determining whether photographs for a proposed catalogue are inappropriate – trivially easy for most humans but currently impossible for machines.

MTurk has become a popular site to hire workers to complete surveys and social science experiments. Participants voluntarily select a HIT and complete it from their own computer. Several studies have compared the quality of data obtained through MTurk, in-person questionnaires, experiments completed on computer at a lab, and face-to-face interviews. Consistently, findings have shown that data from MTurk workers are relatively indistinguishable or even superior to that obtained from American undergraduates (Buhrmester, Kwang, & Gosling, 2011; Casler, Bickel, & Hackett, 2013). In addition, MTurk workers tend to be older, more ethnically and socioeconomically diverse, and have more work experience. MTurk is an established and reliable tool for social scientists to gather data (Behrend, Sharek, Meade, & Wiebe, 2011; Buhrmester, Kwang, & Gosling, 2011; Casler, Bickel, & Hackett, 2013).

## **Chapter 2: Study 1 – Categorizing Statements**

The overall goal of Study 1 was to verify that people consistently categorize statements as factual, religious, or political, and to generate ten statements within each domain to be used in Studies 2-7. Previous research on folk epistemology has often used statements from different domains like moral judgment, social convention, personal taste, factual, religious, etc. (Goodwin & Darley, 2008; Heiphetz et al., 2014). In the previous research, however, no procedure was used to ensure that laypeople intuit the domain of the statements as intended by the researchers. Study 1 was designed to do just that.

### **2.1 Hypotheses**

Hypothesis 1A: Overall, many of the statements will be reliably categorized (enough to proceed with Studies 2-7) with a high level of consistency (more than 75% of the participants will categorize a statement as belonging to a specific domain).

### **2.2 Method**

#### **2.2.1 Participants**

163 Americans (99 males) over the age of 18 (mean age = 37.09) participated in Study 1.

#### **2.2.2 Procedure and Measures**

After providing informed consent, participants were instructed that they would read statements and be asked to categorize each statement into one of four categories: Religious, Political, Factual, or Other. Following the instructions, participants were presented with 93 statements, in random order, and were asked to categorize each statement, one at a time. The

intended categories were 30 political (e.g., “Open homosexuality makes the military weaker”), 30 factual (e.g., “Coca Cola is a brand of soda”), 22 religious (e.g., “Jesus walked on water without sinking”), and 11 other (e.g., “Chocolate is better than vanilla”). For all religious, political, and factual statements, participants were randomly presented with either a statement or its opposite, but not both. For example, any given participant would see “God exists” or “God does not exist,” but not both. A full list of statements and their opposites is shown in Appendix 1.

The political statements were designed to be meaningful to an American population and were inspired by websites like <http://www.democratichub.com/issues.aspx>, which lists current political issues. Both left-wing and right-wing statements were used. The religious statements referred primarily to Christian concepts and stories (e.g., “Jesus,” “Mary,” etc.), although some statements applied to concepts from other traditions as well (e.g., “God,” “Souls,” etc.). The factual statements were straightforward statements about the world, although many of them were false and some were deliberately designed such that the participant would be uncertain if they were true or false. The “Other” category was composed of statements about values, opinions, or nonsense.

Importantly, the religious and political statements were deliberately designed such that they referred to states of the world as opposed to personal values or opinions. For example, rather than the political statement saying “It is wrong for the military to allow open homosexuality” (a statement about a value judgment), the statement said “Open homosexuality makes the military weaker” (a statement about the world). In order to test epistemological intuitions consistently across all domains, it was critical that all statements referred to states of the world. If religious and political statements had referred to values or opinions, then several of

the comparisons across domains would not be possible. For example, a value statement (“Homosexuality is wrong”) is not verifiable without an accompanying universal definition of wrongness. However, a statement referring to the world (“Open homosexuality makes the military weaker”) is theoretically verifiable. For a full list of statements and intended categories see Appendix 1.

## **2.3 Results**

There were a total of 175 unique statements presented to participants, composed of 30 political (and 30 opposites), 30 factual (and 30 opposites), 22 religious (and 22 opposites), and 11 other (no opposites). The percentage of participants who categorized each statement in the same category was calculated for each of the 175 statements. Hypothesis 1A was confirmed. Twenty-three of the political, 33 factual, and 40 religious statements were categorized as intended by at least 75% of participants (see Appendix 1). These statements were identified for possible use in Studies 2-7.

## **2.4 Study 1 Discussion**

In previous research on folk epistemology, researchers asked participants to respond to statements in different domains. In these previous studies, however, researchers generated the statements and decided on their own which domains the statements represented. In the current research, participants were asked to categorize the statements in order to ensure that the statements were understood as intended.

Moreover, because all statements were about the world, it was entirely possible that participants could have categorized them all as facts. For example, the statement “Jesus walked



on water without sinking” could be considered just as much a fact as “Michael Phelps swam in water without sinking.” Study 1 ensured that participants understood the intended domains of the statements that would be used in Studies 2-7. Study 1 generated statements that were categorized in the intended domain by at least 75% of participants.

Based on the percentage of statements categorized as intended, it would appear that participants found religious statements to be the most consistently identifiable (90% of religious statements were categorized as intended by at least 75% of participants). The next most consistently categorized were factual statements (55% of factual statements were categorized as intended by at least 75% of participants). Lastly, 38% of political statements were categorized as intended by at least 75% of participants. Some of the factual statements were false (e.g., “Limes are a poor source of vitamin C”). False facts seemed to confuse participants, often being categorized as “other,” perhaps because participants interpreted “fact” as meaning “true” (even though the instructions said not to equate “fact” with “true”). Participants also appeared to use particular terms to help them categorize statements. For example, in the political domain, statements explicitly referring to the country or government institutions were among the most consistently categorized as political. Finally, several statements that were intended to be political were categorized by a significant proportion of participants as factual. This confusion between the intended category (political) and what participants understood (factual) was exactly the problem that Study 1 was designed to detect. These statements were not used in Studies 2-7. Only statements that were consistently categorized as intended by at least 75% of participants were used in Studies 2-7.

### **Chapter 3: Study 2 – Resolving Uncertainty**

The goal of Study 2 was to determine if religiosity and political orientation, as measured by the New Indices of Religious Orientation (Francis, 2007) and Right-Wing Authoritarianism (Altemeyer, 2007) scales, respectively, correlated with the extent to which participants reported that religious and political, but not factual statements, were true. In other words, Study 2 evaluated whether scores on the NIRO predicted how certain one was that religious statements were true, and whether scores on the RWA predicted how certain one was that political statements were true. (The NIRO scale is composed of three independent subscales: the extrinsic, intrinsic, and quest orientations. For all analyses involving the NIRO, the intrinsic orientation score was used. The intrinsic orientation deals with the personal belief aspect of religiosity, which is most relevant to the current research.)

The purpose of measuring these correlations was to validate the materials that would be used in Studies 3-7. It was important not only that participants could recognize the domain of the statement (accomplished in Study 1) but also that the statements were shown to be religiously or politically meaningful to participants. In addition, Study 2 sought to demonstrate that participants find uncertainty to be more difficult to resolve in the religious and political domains than in the factual domain. More specifically, the prediction in Study 2 was that factual uncertainty arises from a lack of necessary information, whereas religious (and to a lesser extent political) uncertainty arises from an “unknowableness” of religious (and political) propositions. For example, if one is uncertain whether Tokyo is north or south of Philadelphia, one need only consult a map to find the answer. However, if one is uncertain about whether God exists or not, this uncertainty cannot be resolved by simple, available information.

Resolving uncertainty offers a window into how participants think about acquiring knowledge. If one finds uncertainty easy to resolve, it is because the proposition can be verified by an observation in the world, its logical coherence can be evaluated, or some other readily available method can be employed. Conversely, if one finds uncertainty difficult or impossible to resolve, it signals a sense that the proposition is unknowable.

### **3.1 Hypotheses**

Hypothesis 2A: Certainty that religious statements are true will correlate positively with one's NIRO score, and certainty that political statements are true will correlate positively with one's RWA score.

Hypothesis 2B: Participants will report that uncertainty in the religious domain is the most difficult to resolve, followed by the political and then by the factual domain.

### **3.2 Method**

#### **3.2.1 Participants**

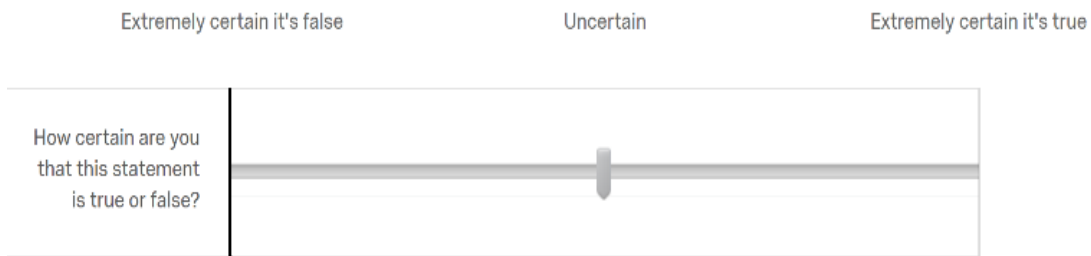
158 Americans (104 males) over the age of 18 (mean age = 38.44), recruited from MTurk participated in Study 2.

#### **3.2.2 Procedure and Measures**

After consenting to participate in the study, participants were presented with 30 statements in random order (10 religious, 10 political, and 10 factual), chosen from Study 1 based on being categorized in the intended domain by at least 75% of participants in Study 1. After participants read each statement, they were asked the following questions:

Question 1: “Without doing any research, how certain are you that the following statement is true or false?”

Participants indicated their degree of certainty by moving a slider, labeled as follows: Left (0): “Extremely certain it’s false”; middle (50): “Uncertain”; right (100): “Extremely certain it’s true.” The slider did not display any numbers to the participant in order to avoid consistency bias (this was the case for all sliders in all studies). The starting position of the slider was in the middle (50). Figure 1 shows an image of the slider.



**Figure 1.** Example of a slider used in the studies

Question 2: “Sometimes you are uncertain about the truth of a statement but it is very easy to resolve your uncertainty. For example, consider the statement, “It is raining in Tokyo right now.” You are probably uncertain whether this statement is true or false, but you could easily resolve your uncertainty by looking up a weather report for Tokyo. However, sometimes uncertainty is very difficult to resolve. For example, consider the statement, “Before time, there was no universe and no physical matter.” If you were uncertain whether this is true or false, you probably could not resolve your uncertainty with easily available information. Considering the current statement below, how easy/difficult would it be to resolve uncertainty about whether this statement is true or false?”

Participants indicated how easy/difficult it would be to resolve uncertainty about the statement by moving a slider. The slider was labeled as follows: Left: “Extremely easy to resolve”; middle: “Moderate”; right: “Extremely difficult to resolve.” The starting position of the slider was set in the middle. After providing their ratings for the 30 statements, participants completed the NIRO (see Appendix 4), RWA (see Appendix 5), and demographic (see Appendix 6) questionnaires and were thanked for their participation in the study.

For a list of statements used in Study 2, see Appendix 2. In the factual domain, statements included those that are obviously true, obviously false, and uncertain. In the religious and political domains, most statements were “pro-religious” and right wing, and some were “anti-religious” and left wing. The anti-religious and left-wing statements are marked with an “(R)” after them in Appendix 2. These statements were reverse scored for certain analyses.

### **3.3 Results**

Responses to question 1 (certainty of truth) were averaged across statements within the same domain for each participant. This process generated a mean certainty-of-truth value for each domain (religious, political, factual) for each participant. The same process was completed for responses from question 2. Statements P1, P4, and R9 were reverse scored in order to remain consistent (right wing vs. left wing in the political domain, and religious vs. anti-religious in the religious domain).

RWA and NIRO scores were calculated for each participant. Correlations between mean certainty scores and the RWA and NIRO scores were calculated for each domain. As may be seen in Table 2, scores on both the RWA and the NIRO were significantly correlated with participants’ certainty of the truth of statements in both the political and religious domains. There

was no significant relation between RWA and NIRO scores and degree of certainty as to the truth of factual statements.

**Table 2.** Correlations between mean certainty of truth and RWA and NIRO scores

Scale	Religious	Political	Factual
RWA	.634***	.572 ***	-0.09
NIRO	0.809***	0.349***	-0.011

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

The mean difficulty-to-resolve-uncertainty scores for each participant and each domain were entered into a repeated measures ANOVA as the dependent variable. The independent variable was domain (political, religious, factual). As may be seen in Table 3, there was a large difference in mean difficulty to resolve uncertainty, between the domains. There was a statistically significant effect of domain on difficulty-to-resolve-uncertainty score  $F(2, 156) = 214.20, p < .001$ . All pairwise comparisons showed a significant difference,  $p < .001$  in all cases. Furthermore, as predicted, participants reported that religious uncertainty was the most difficult to resolve followed by political followed by factual.

**Table 3.** Mean difficulty (SE) to resolve uncertainty and standard error according to domain

Domain	Mean difficulty (SE) to resolve uncertainty
Factual	11.72 (1.46)
Political	49.72 (1.37)
Religious	62.12 (2.44)

### 3.4 Study 2 Discussion

The primary finding from Study 2 was that people think of uncertainty differently across the three domains tested. Factual uncertainty is seen as easily resolved, whereas political and religious uncertainty are judged as more difficult to resolve. Because participants think of

uncertainty so differently, it can be inferred that they also think of certainty differently. This difference among domains supports the argument that religious (and some political) beliefs are based on intuitive standards/principles different from those of factual beliefs. For example, some form of verification is often used to determine if factual propositions are true whereas verification is less often the basis for believing a religious proposition to be true. The relatively high degree of difficulty to resolve political and religious uncertainty signals that participants don't feel those forms of knowledge can be acquired as easily and these domains are more unknowable. Studies 3-7 test many of the specific differences in intuitive theories/principles that people use to think about their own knowledge across the three domains.

Study 2 also showed that the statements used were valid and served their intended purpose. Specifically, certainty that religious and political statements were true correlated with two well-known scales of political orientation and religiosity – the RWA and NIRO. If it had turned out that belief that the statements were true did not correlate with scores on the RWA or the NIRO, then the meaning of the statements to participants would have been unclear. Because religiosity and right-wing political orientation are highly correlated with each other, correlations between religious certainty and RWA score and political certainty and NIRO score also were observed. However, the overall goal to show that the statements have religious or political meaning was accomplished.

## **Chapter 4: Study 3 – Verification**

The purpose of Study 3 was to investigate the epistemological concept of verification in laypeople. Do laypeople think verification is important when determining what is true? Do they think their beliefs are theoretically verifiable? Study 3 sought to demonstrate that laypeople substantially rely on verification and they believe it to be an important component of justification (the process for establishing what is true). More specifically, the prediction was that laypeople believe that facts can be theoretically verified more than political beliefs, and that religious beliefs are the least theoretically verifiable. This prediction follows from the view that political and religious beliefs are less likely to depend on any state of the world or be justifiable through evidence. Conversely, they are more likely to be acquired through the testimony of others, particularly at a young age. For example, a belief like “Jesus is the son of God” may be vigorously debated, but there is unlikely to be a state of the world that could satisfactorily determine who is correct.

Another prediction in Study 3 was that highly religious individuals would value verification less as a means of determining truth. This prediction was based on the idea that a religious worldview involves non-normative methods for determining truth, such as revelation and faith. Devaluing verification could be a way to reconcile the problem that propositions are true, but nevertheless cannot be verified. For example, consider the belief that snake venom is not harmful to Christians. There is no supporting evidence for this belief, and yet some people believe it to be true, enough to motivate them to handle and be bitten by snakes. It is possible that in order to reconcile the information from the world (snake bites are dangerous) with their



conflicting belief (snake bites are harmless), believers would devalue verification as an epistemological tool and, instead, rely on faith.

## **4.1 Hypotheses**

Hypothesis 3A: Facts will be said to be theoretically verifiable most frequently, followed by political and then religious statements.

Hypothesis 3B: There will be a negative correlation between scores on the NIRO and responses to questions 2 and 3 (i.e., whether verifiability is necessary for knowing a proposition is true and whether observable evidence in the world is the best proof that a proposition is true).

Hypothesis 3C: When asked generally (not with respect any statement in particular), participants will respond that, on average, verifiability is necessary in order to know a statement is true and that evidence in the world as the best form of proof.

## **4.2 Method**

### **4.2.1 Participants**

160 Americans (108 males) over the age of 18 (mean age = 40.46 years old), recruited from MTurk, completed the study.

### **4.2.2 Procedure and Measures**

#### **Procedure for Part 1 of Studies 3-7**

Studies 3-7 all included two parts. Part 1 for Studies 3-7 was identical. In Part 1, participants were presented with 30 statements in random order, ten statements from each of the three domains – political, factual, and religious (see Appendix 3 for a list of all statements).

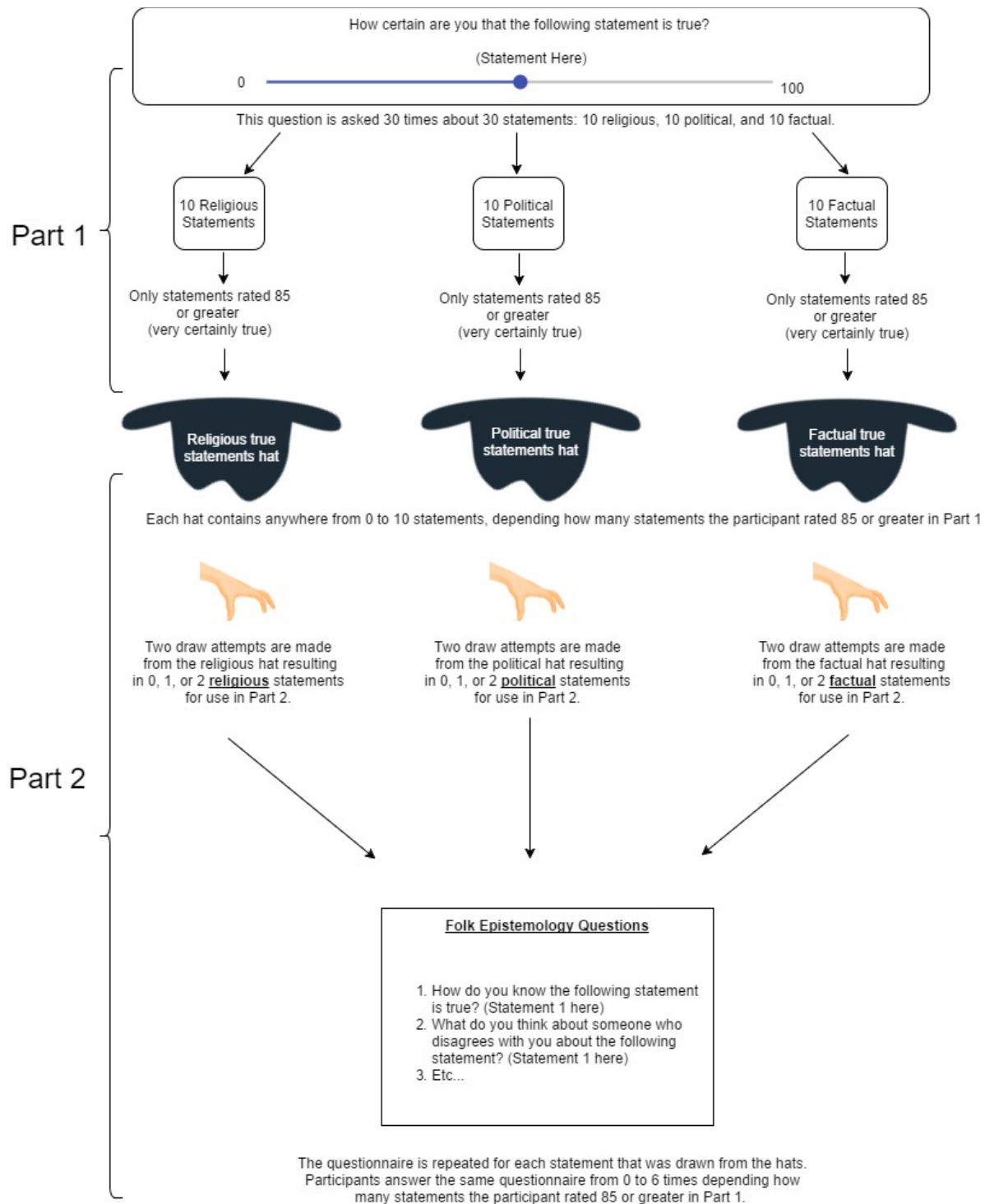
These 30 statements had been derived from Studies 1 and 2. Along with each of the 30 statements, participants were asked the following question:

Question 1: “Without doing any research, how certain are you that the following statement is true?”

To respond, participants adjusted a slider from “Extremely uncertain” (0) to “Extremely certain” (100), with “Moderately certain” (50) at the midpoint. The slider’s starting position was at 0, under “Extremely uncertain” (see Fig. 1).

After answering question 1 for all 30 statements, Part 1 was complete, and participants proceeded to Part 2. In Part 2, up to six statements from Part 1 (two religious, two political, and two factual) were presented again to the participant. Only statements that the participant had indicated were very certainly true (rated at least 85/100 on question 1 in Part 1) were selected from Part 1 to be presented again in Part 2. If a participant didn’t rate at least two statements as very certainly true ( $\geq 85$ ) in a particular domain, then less than two statements were tested for that domain in Part 2 (either 1 or 0 statements). If more than two statements were rated as very certainly true from a particular domain, then only two statements were selected randomly for use in Part 2. This method of selecting statements from Part 1 for use in Part 2 was identical for Studies 3-7 and is depicted in Figure 2. After each statement was presented again in Part 2, the participant was asked epistemological questions about that statement (e.g. “Do you think this statement is verifiable?”). The “Folk Epistemology Questions” in Figure 2 represents the epistemological questions that went with each statement presented in Part 2. The exact questions that made up the “Folk Epistemology Questions” differed across Studies 3-7, but the general flow and structure of all the studies was the same. It is to be recalled that even though the slider

depicted in Figure 2 shows numbers, no numbers were shown to the participants in any of the studies.



**Figure 2.** Diagram of the procedure for Studies 3-7.

After responding to all of the questions, participants completed the NIRO (see Appendix 4), RWA (see Appendix 5), and demographic (see Appendix 6) questionnaires, and were thanked for their participation in the study.

### **Epistemological Comparisons Across Domains in Studies 3-7**

Studies 3-7 investigated folk epistemological differences among the religious, political, and factual domains. The overarching question that these studies examined was: do people believe religious propositions (e.g., "God exists") or political propositions (e.g., "Most people on welfare are abusing the system rather than looking for work") in the same way that they believe facts (e.g., "Maine is north of Florida")?

On the one hand, people take their religious and political beliefs very seriously. They make important decisions based on them, like who they should marry, which medical treatments they should seek, and which politicians they should support. People may point to personal experiences as a source of religious and political belief. These observations suggest that people represent their religious and political beliefs as equally verifiable, based on evidence, and as objectively true, as factual beliefs. On the other hand, people also resist evidence that pertains to these beliefs, adopt the religious and political propositions of their ingroup, and readily identify outgroup beliefs as obviously false. These observations seem to indicate that people view religious and political beliefs as categorically distinct from everyday facts.

Based on these opposing perspectives, it was not known in advance how people would respond to epistemological questions about their religious, political, and factual beliefs. Nevertheless, in Studies 3-7, the general prediction was made that participants differentially think about the underlying epistemology for religious, political, and factual statements. For

example, in Study 3, it was predicted that factual statements would be viewed as most verifiable, followed by political, and then religious statements. In other studies, predictions were made about falsification, correspondence, obviousness, doubt, objectivity, and other concepts. In all studies, the prediction was that people view religious and political beliefs as epistemologically distinct from facts.

Moreover, several methodical measures were taken to ensure that valid comparisons of folk epistemology could be made across domains. One goal of these measures was to prevent participants from evaluating religious, political, and factual statements on the features that made them simply, by definition, distinct. For example, the statement, “Strawberry ice cream is the best flavor” is by definition subjective whereas, “Strawberry ice cream melts at a temperature of 70 degrees Fahrenheit,” is by definition objective. In order to minimize investigating purely definitional differences, all statements used in the research referred to the world as opposed to values or opinions. Hence they were theoretically, epistemologically equivalent across a number of dimensions (e.g., they were all theoretically verifiable). For example, the political statement, “The right to own guns makes society safer,” and the factual statement, “Germs are very small,” are equally verifiable and falsifiable. They can be equally evaluated for their correspondence to the world, coherence with other truth, and pragmatism.

Other methodological considerations were made to increase the validity of the comparisons across domains. Where necessary, participants were instructed to consider the epistemological concept “theoretically” (e.g., in Study 3 participants were asked if statements were *theoretically* verifiable). This instruction was meant to prevent participants from responding to whether a proposition was difficult versus easy to verify in practice.

Certainty of truth was also controlled for in order to prevent lack of certainty from affecting underlying folk epistemology. In Part 2 of Studies 3-7, participants only reflected upon statements that they individually had rated in Part 1 as very certainly true (at least 85/100 in Part 1). Hence, the religious and political statements were never treated differently by participants due to a lack of explicit certainty that they were true. In other words, all responses to the folk epistemology questions in Part 2, were from participants who were very certain the target statement was true.

Finally, for political and religious statements, it was entirely possible that participants would refrain from responding in any way that could be interpreted as betraying uncertainty or lack of belief, due to the negative feelings such an event might cause. Questions were designed to be indirect and phrased to avoid causing participants to respond defensively.

Given these points, it was not obvious how participants would answer the epistemological questions about factual, political, and religious statements in Studies 3-7. Conceivably, it could have been the case that people viewed religious and political truth as identical in nature to factual truth. Alternatively it could be that, as predicted, laypeople are intuitively aware of a variety of departures from normative epistemology underlying their religious and political beliefs. In addition, measures were taken to ensure that valid comparisons of folk epistemology were made across domains, illuminating more than merely definitional differences in statements.

### **Study 3 Procedure and Measures**

In Study 3, the “Folk Epistemology Questions” component from Figure 2 was designed to test verification, and consisted of the following instructions and questions that were presented to participants:

“Some statements can be proven to be true while others cannot. Please note, this is not the same as whether a statement actually is true or not. In Part 2, we are **not** interested in whether you think a statement is true or not. We are only interested in whether you think it is possible to prove the statement to be true. To help understand what we mean, please consider examples in the table below.

<u>Statement</u>	<u>Conditions that would prove it to be true</u>	<u>Possible to prove true?</u>
There is intelligent life on the moon	Astronauts travel to the moon and find intelligent life there. (Please note, this statement is false, but it is possible to prove it to be true.)	Yes
It is dark outside where you are now	You look outside and see it is dark.	Yes
The number of hairs on your body is even	With other people’s help, you count every single hair on your body. (Please note: even though this would be very difficult, it is <i>theoretically</i> possible to count every hair on your body.)	Yes
If Abraham Lincoln had never been assassinated, the world would be a better place	To prove this statement to be true you would need to change something that has already occurred, which is not even theoretically possible.	No

Consider the following statement from Part 1: [Here one of the statements from Part 1 appeared]. Question 1: Do you think it is theoretically possible to prove that this statement is true?” Participants could respond with a “yes” or a “no” to the question about verification. After completing the Folk Epistemology Questions component (Part 2), participants in Study 3 then were asked two additional questions:



Question 2: “To what extent do you agree with the following statement: In order to know a statement is true, it must be theoretically possible to prove it to be true.”

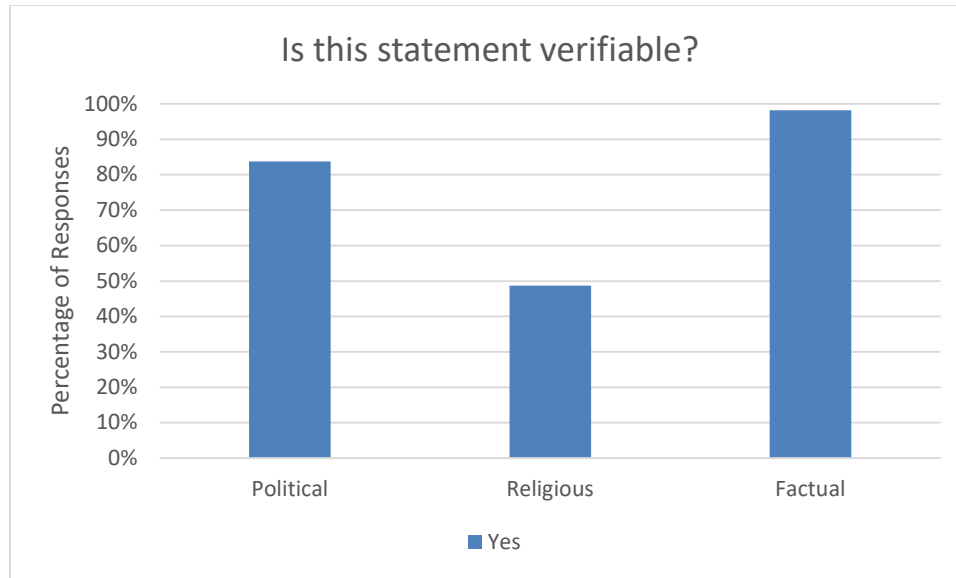
Question 3: “To what extent do you agree with the following statement: The best proof that a statement is true is evidence that people can observe in the world.”

Both questions allowed the participant to respond with a slider from 0 – “Totally disagree” to 100 – “Totally agree.” All sliders did not display numbers, only words.

### **4.3 Results**

In Part 1 of the study, some participants did not indicate that they were highly certain that any statement was true for at least one of the domains. In other words, referring to Figure 2, one or more of the “hats” was empty when transitioning from Part 1 to Part 2. Hence, in Part 2, these participants only responded to epistemological questions about two or fewer domains. It was preferable to have at least one data point for each participant for each domain in Part 2, so these participants were excluded from the analyses, leaving 109 participants (78 males).

Participants responded to question 1 with a yes/no response, as to whether a statement was verifiable or not. A chi-square analysis was used to determine if there were significantly more “yes” versus “no” responses comparing across domains. As predicted, the highest percentage of participants responded that factual statements were verifiable, followed by political statements, followed by religious statements (see Fig. 3; chi square = 151.082,  $df = 2$ ,  $p < .0001$ ). All pairwise comparisons were statistically significantly different: Political vs. religious chi square = 52.02,  $df = 1$ ,  $p < .0001$ ; political vs. factual chi square = 26.79,  $df = 1$ ,  $p < .0001$ ; factual vs. religious chi square = 133.81,  $df = 1$ ,  $p < .0001$ ).



**Figure 3:** Frequency of “yes” responses to verification question

Mean slider responses and standard error for questions 2 and 3 are presented in Table 4.

**Table 4.** Mean slider responses (SE) to questions 2 and 3

Question 2 and 3: To what extent do you agree with the following statement?	Mean Response (SE)
In order to know a statement is true, it must be theoretically possible to prove it to be true.	69.61 (3.32)
The best proof that a statement is true is evidence that people can observe in the world.	76.03 (2.86)

Scores on the NIRO were significantly negatively correlated with the slider responses on questions 2 and 3. The correlation between NIRO score and question 2 was  $-.38$  ( $p < .0001$ ) and between NIRO score and question 3 was  $-.46$  ( $p < .0001$ ).

To check for effects of religiosity and political orientation on responses to question 1 (Part 2), first the average number of “yes” responses was calculated for religious statements and

for political statements. Then a correlation was calculated between the NIRO score and average number of “yes” responses to religious statements. There was no significant correlation,  $r = .10$ ,  $p = .28$ . There was a weak, but significant correlation found between RWA scores and average number of “yes” responses to question 1 with respect to political statements,  $r = .20$ ,  $p = .04$ .

#### **4.4 Study 3 Discussion**

Study 3 tested how people think about verification with respect to political, religious, and factual beliefs, and results confirmed all three hypotheses. Hypothesis 3A was supported: factual statements were most frequently said to be verifiable, followed by political, followed by religious statements. This finding was the primary goal of Study 3, and supports the argument that religious and political beliefs depend relatively less on evidentialism, verification, or other normative epistemological standards, compared to factual beliefs. Interestingly, believers who were highly certain these propositions were true were willing to report their lack of verifiability.

Hypothesis 3B was supported. Those who scored more highly on the NIRO scale were less likely to say that verification is the best way to justify beliefs. This finding suggests that high-religiosity individuals do not view verification as the only or best path to determining what is true (at least explicitly). It could be that higher religiosity individuals adopt alternative sources of knowledge such as revelation, faith, or the testimony of others, and therefore come to think of verification as relatively less valuable.

Hypothesis 3C was supported. Participants, overall, value verification as a means of determining what is true. Participants responded with an average agreement rating of 69.61 (on a scale from 0 to 100) that, “In order to know a statement is true, it must be theoretically possible to prove it to be true.” This indicates that people do feel verification is a necessary component of

justification. In addition, participants, on average, valued observable evidence in the world as the best proof that a statement is true, responding with an average agreement rating of 76.03. This finding indicates that people use evidentialism and observable states of the world in the process of determining what is true.

In sum, more participants responded that facts were verifiable than said political and religious beliefs were verifiable, but higher religiosity and right-wing individuals viewed verification as less important for obtaining knowledge.

## **Chapter 5: Study 4 – Falsification**

The purpose of Study 4 was to investigate the epistemological concept of falsification in laypeople. Do laypeople think falsification is important when determining what is true? Do they think their own beliefs are theoretically falsifiable?

Study 4 sought to demonstrate that laypeople find factual beliefs most falsifiable followed by political followed by religious beliefs, which are the least falsifiable. This prediction was based on the idea that political and religious beliefs are less likely to depend on any state of the world or be justifiable through evidence. In Study 3, a prediction was that laypeople hold verification to be an important component of justification (the process for establishing what is true). In Study 4, however, it was predicted that laypeople would value falsification less than verification. This was predicted because attempting to prove a proposition is false in order to support its truth could be counterintuitive and less useful to laypeople than verification. In addition, previous research on the confirmation bias has shown that people often seek to verify their hypotheses more than they seek to falsify them (Nickerson, 1998).

Another prediction in Study 4 was that highly religious individuals would value falsification less as a means of determining truth compared to less religious individuals. This prediction was based on the idea that a religious worldview involves methods for determining truth, including revelation and faith, which do not depend on or relate to states of the world. Truth depending on falsifiability conflicts with the religious worldview. In addition, pondering conditions that would render one's religious or political beliefs false has been shown to cause negative affect (Tetlock, Kristel, Elson, Green, & Lerner, 2000), and therefore it is possible that highly religious individuals would avoid falsification or think of it as less useful.

## **5.1 Hypotheses**

Hypothesis 4A: Facts will be said to be theoretically falsifiable most frequently, followed by political and then religious statements.

Hypotheses 4B: People will on average, respond that falsifiability is necessary in order to know a statement is true. However, the mean response will be lower than the mean response from Study 3 regarding whether verifiability is necessary in order to know a statement is true. Participants will, on average, value evidence in the world as the best proof that a proposition is false.

Hypothesis 4C: There will be a negative correlation between scores on the NIRO scale and responses to questions 2 and 3 (i.e., whether falsifiability is necessary for knowing a proposition is true and whether observable evidence in the world is the best proof that a proposition is false).

## **5.2 Method**

### **5.2.1 Participants**

154 Americans (105 males) over the age 18 (mean age = 40.2 years old), recruited from MTurk, participated in the study.

### **5.2.2 Procedure and Measures**

Part 1 of Study 4 was identical to that of Study 3. The structure of Part 2 was identical to that of Study 3, except that the questions in Part 2 were different in order to test laypeople's views of falsification rather than verification. In Part 2, participants were presented with the following instructions after each statement:

“Some statements can be proven to be false while others cannot. Please note, this is not the same as whether a statement actually is false or not.

In Part 2, we are **not** interested in whether you think a statement is false or not. We are only interested in whether you think it is possible to prove the statement to be false. To help understand what we mean, please consider examples in the table below.

<u>Statement</u>	<u>Conditions that would prove it to be false</u>	<u>Possible to prove false?</u>
All swans are white	You see a black swan	Yes
The moon is made of cheese	Astronauts travel to the moon and find it is not made of cheese.	Yes
Barack Obama is the president	You learn that everyone has tricked you and Barack Obama is not the president. He is actually an actor who was hired to play the president as part of the trick. (Note: In reality, Barack Obama is the president but it is at least theoretically possible to prove this statement to be false.)	Yes
There is a species of fish with an amazing type of camouflage. The fish is so camouflaged that it cannot be detected by anything.	In order to prove this statement is false, it would be necessary to prove that there is no such fish. But the fish can avoid all detection so it's theoretically impossible to prove it's not there.	No

Consider the following statement from Part 1:

[A statement from Part 1 appeared here.]

Question 1: Do you think it is theoretically possible to prove that this statement is false?”

After completing Part 2, participants then were asked to answer the following two additional questions, and responded to each using a slider that ranged from 0 – “Totally disagree” to 100 – “Totally agree”:

Question 2: “To what extent do you agree with the following statement: In order to know a statement is true, it must be theoretically possible to prove it to be false.”

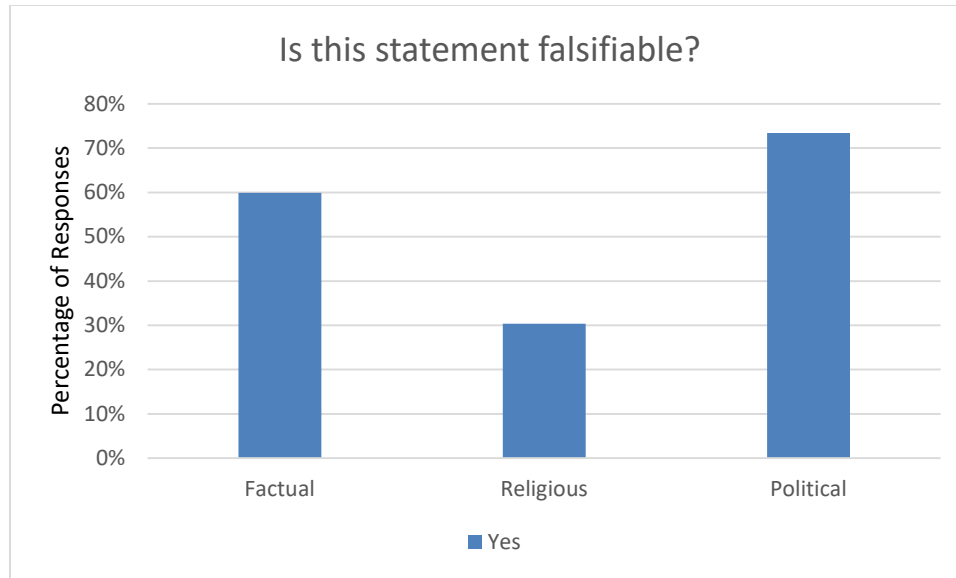
Question 3: “To what extent do you agree with the following statement: The best proof that a statement is false is evidence that you can observe in the world.”

### 5.3 Results

In Part 1 of the study, some participants did not indicate that they were highly certain that any statement was true for at least one of the three domains. It was preferable to have at least one data point for each participant for each domain, so these participants were excluded from the analyses, leaving a remaining 96 participants (71 males).

Participants responded with a yes/no response as to whether a statement was falsifiable or not. Significantly fewer participants responded that religious statements were falsifiable. Interestingly, political statements were classified as falsifiable by a slightly greater percentage of participants than were factual statements (see Fig. 4). A chi-square analysis revealed that differences were statistically significant across domains,  $\chi^2 = 65.24$ ,  $df = 2$ ,  $p < .0001$ . All comparisons were significantly different: Political vs. religious  $\chi^2 = 61.34$ ,  $df = 1$ ,  $p < .0001$ ; political vs. factual  $\chi^2 = 7.21$ ,  $df = 1$ ,  $p = .007$ ; factual vs. religious  $\chi^2 = 31.46$ ,  $df = 1$ ,  $p < .0001$ ).





**Figure 4:** Frequency of “yes” responses to falsification question

Mean slider responses and standard errors for questions 2 and 3 are given in Table 5.

**Table 5.** Mean slider responses (SE) to questions 2 and 3

Question 2 and 3: To what extent do you agree with the following statement?	Mean Response (SE)
In order to know a statement is true, it must be theoretically possible to prove it to be false.	58.53 (3.66)
The best proof that a statement is false is evidence that people can observe in the world.	69.77 (2.99)

Scores on the NIRO were not significantly correlated with the slider responses on question 2, but there was a negative correlation with responses to question 3. The correlation between NIRO score and question 2 was  $-.04$  ( $p = .66$ ) and between NIRO score and question 3 was  $-.27$  ( $p = .01$ ).

To check for effects of religiosity and political orientation on responses to question 1, the average number of “yes” responses was calculated for religious statements and for political

statements. Then a correlation was calculated between the NIRO score and average number of “yes” responses to religious statements. There was no significant correlation,  $r = .19, p = .07$ . There also was no significant correlation found between RWA scores and average number of “yes” responses to question 1 with respect to political statements,  $r = -.06, p = .53$ .

## **5.4 Study 4 Discussion**

Hypothesis 4A was partially supported. The primary finding was that, as predicted, a significantly larger percentage of participants responded that religious statements were unfalsifiable compared to factual or political statements. It is to be noted that factual statements were said to be falsifiable less frequently than were political statements. It is possible that the participants could not imagine a realistic way to falsify an obviously true fact. For example, what would be required to falsify a statement like, “Coca Cola is a brand of soda?” Only a massive conspiracy involving the entire population of the world could be the answer. So even though such a statement is theoretically falsifiable, it may have been difficult for participants to imagine a set of circumstances in which falsification could occur. A number of participants may have responded that obviously true facts were unfalsifiable, thereby misunderstanding the theoretical possibility of falsification. This potential misunderstanding does not diminish the validity of the data with respect to religious statements. The instructions asked participants if they could imagine a set of circumstances in which the statement could be false. Even if participants were unable to correctly apply the idea of theoretical falsifiability to factual statements, the finding that participants could not imagine a set of circumstances that would cause their religious beliefs to be false still reveals an interesting difference in how people think about religious versus factual beliefs.

Hypothesis 4B was supported. Participants responded with an average agreement rating of 58.53 (on a scale ranging from 0 to 100, with 50 representing moderately in agreement), that, “In order to know a statement is true, it must be theoretically possible to prove it to be false.” This indicates that people do value falsification but less so than verification, which scored an average agreement rating of 69.61 that, “In order to know a statement is true, it must be theoretically possible to prove it to be true.” However, participants on average valued evidence in the world as the best proof that a statement is false, responding with an average agreement rating of 69.77. This finding indicates that people on average use evidentialism and observable states of the world in the process of determining what is false.

Hypothesis 4C was not supported. There was not the predicted negative correlation between degree of religiosity as measured by scores on the NIRO and valuing falsifiability (question 2), although there was a negative correlation between the NIRO scores and valuing observable evidence in the world (question 3). Hypothesis 4C was based on the idea that a religious worldview depends less on evidentialism and that attempting to falsify religious beliefs might cause negative affect (Tetlock et al., 2000). It is still possible that these influences diminish the extent to which one values falsification as an epistemological tool.

The concept of falsification may well have been counterintuitive to many of the participants. If one were unfamiliar with falsification, it is possible that a proposition would appear less true if it could theoretically be proven false. In the instructions, participants were educated about the meaning of falsification and provided with several examples. However, they were not instructed about exactly how to value falsification or why it functions well in advancing true hypotheses. It seems likely that the distribution of responses to questions 2 and 3 was

primarily influenced by an understanding of falsification (those who understood falsification more valued it more), more than it was influenced by religiosity level. The failure to find a significant negative correlation does not call into question the validity of the other findings nor does it rule out the possibility that religiosity does negatively correlate with valuing falsification under circumstances in which the role of falsification is well understood by the participants.

## **Chapter 6: Study 5 – Theories of Truth**

The purpose of Study 5 was to investigate three theories of truth from academic epistemology in laypeople: correspondence, coherence, and pragmatic. Study 5 also explored the extent to which people rely on two sources of knowledge: testimony of others and faith. Specifically, Study 5 asked which of these theories of truth laypeople intuitively understand and use when asked to define why a proposition is true, and whether there would be differences depending on the domain. How do testimony of others and faith serve as sources of knowledge across domains?

Study 5 made several predictions. It was predicted that laypeople would report that their religious and political beliefs correspond to the world less, and cohere with other true propositions less than factual beliefs do. These predictions were based on two ideas. One is that many religious and political propositions do not accurately describe any state of the world and are inconsistent with other true propositions. As a consequence, these propositions cannot be true by virtue of correspondence or coherence. For example, consider the statement, “Noah put all animal species onto an ark to save them from a flood.” Such a statement refers to the world. However, nothing in the world convincingly corroborates it. There is nothing in the world that suggests such an ark or flood existed. True propositions about animal species also conflict with such a claim. It would be impossible for an ark to house millions of animal species, each requiring complex habitats, resources, and so on. Neither correspondence nor coherence can function as defining properties of truth.

The second idea inspiring this prediction is that people do not want their religious and political beliefs to be held hostage by correspondence or coherence. In other words, the idea that

religious and political propositions could be proven to be false based on a lack of correspondence or coherence is unacceptable to believers, and therefore these properties must not define why these propositions are true.

It also was predicted in Study 5 that people would be more likely to endorse the pragmatic theory for defining the truth of religious and political propositions more than factual propositions. Consequences and functionality of belief are used in the religious and political domains more than in the factual domain as a defining property of truth. A lay version of the pragmatic theory was investigated in Study 5 where the function of truth is tied to the good of society. For example, “When everyone believes in God, society works better.”

It was predicted that laypeople would say that the testimony of others is more a source of knowledge in the religious and political domains compared to the factual domain. The explanation for this prediction is that people often adopt religious and political ideas from their ingroup as opposed to acquiring them from observation. For example, the evidence surrounding a political issue like climate change is inaccessible to laypeople, yet many report to be extremely certain about whether humans are causing global warming. Many religious and political propositions are acquired at a young age without any opportunity for critical analysis. In order to explore how laypeople rely on testimony across domains, Study 5 included one question about reliance on trust in others and one about the importance of acquiring the belief before 25 years of age.

Finally, Study 5 explored the idea of faith by asking people if their beliefs need to be justified in order to be true. The prediction was that participants would say religious beliefs require the least justification followed by political and then factual. The rationale for this

prediction was that religious believers rely on faith as a source of knowledge rather than justification. In addition, both religious and political believers might not want the truth of their beliefs to depend on justification, preferring for it to be outside the reach of any process that could prove it to be false.

## **6.1 Hypotheses**

Hypothesis 5A: When determining a statement to be true, participants will use correspondence theory mostly for factual statements, followed by political followed by religious statements.

Hypothesis 5B: When determining a statement to be true, participants will use coherence theory mostly for factual statements, followed by political followed by religious statements.

Hypothesis 5C: When determining a statement to be true, participants will use the pragmatic theory (a lay version of it) mostly for religious/political statements, and less for factual statements.

Hypothesis 5D: When determining a statement to be true, participants will rely on trusting others most for religious statements, followed by political followed by factual statements.

Hypothesis 5E: Participants will report that religious statements would be least likely to be believed if encountered after the age of 25, followed by political, followed by factual statements.

Hypothesis 5F: Participants will report that they need justification the least to know religious statements are true, followed by political, followed factual statements.

## **6.2 Method**

### **6.2.1 Participants**

152 American participants (97 male) over the age of 18 (mean age 37.11), recruited from MTurk, participated in the study.

### **6.2.2 Procedure and Measures**

Study 5 investigated people's theory of truth/justification (i.e., why/how do you think this statement is true?) across the three domains. Three well-known, philosophical theories of truth were tested: correspondence, coherence, and pragmatic. Two additional bases for truth were tested: faith (which was tested by asking participants how much they need to justify a statement in order to believe it), and trust in other people/indoctrination (meant to investigate how laypeople use the testimony of others).

Participants completed Part 1, just as in the previous studies. In Part 2, along with each statement, participants were presented with the following questions in random order.

#### **Correspondence**

“People have different reasons for believing what is true. Sometimes, people believe that a statement is true because specific events or circumstances in the world make the statement true. So, a person might say: “I believe this statement is true because of these circumstances or events in the world. If these circumstances or events were different, then the statement might not be true.”

However, sometimes people believe that a statement is true independent of any circumstances or events in the world. So, a person might say: “I believe this statement is true



independent of circumstances or events in the world. Even if the world were different, I would still believe this statement is true.”

In Part 1 you indicated that you were highly certain that the statement below is true. Do you believe that the statement below is true because of circumstances or events in the world, or independent of circumstances or events in the world?

[A statement from Part 1 appeared here].

Question 1: Why do you believe this statement is true?” [Participants saw a slider labeled 0, “Completely because of circumstances or events in the world” to 100, “Completely independent of circumstances or events in the world”].

### **Coherence**

“Some people think that in order for a statement to be true it must be consistent with all other information that we already know is true. According to this perspective, all true statements fit together like pieces of a big puzzle. Each piece of the puzzle is connected to other pieces. If a statement does not fit into the puzzle, then it is not consistent with other true statements and cannot be true.

Alternatively, some people think that it is possible for statements to be true that are not consistent with one another. According to this perspective, statements can be true even if they do not fit with other true statements.

In Part 1 you indicated that you were highly certain that the statement below is true. We are interested in which perspective best describes why you feel the statement below is true. Using the slider below, please indicate how consistent you think the statement below is with everything else in the world that is true.

[A statement from Part 1 appeared here].

Question 2: How consistent is this statement with everything you know is true in the world?" [Participants saw a slider from 0, "Completely inconsistent with everything that is true" to 100, "Completely consistent with everything that is true"].

### **Pragmatic**

"Some people think that a statement can be true because when everyone believes the statement is true, society works better. For example, some people think that the statement "voting in large elections is a good use of one's time" is a true statement because if everyone believes that voting is a good use of time, then democracy functions well.

In Part 1 you indicated that you were highly certain that the statement below is true. To what extent do you think the statement below is true because when everyone believes this statement is true, there is a positive effect on society?

[A statement from Part 1 appeared here].

Question 3: To what extent do you think this statement is true because when everyone believes this statement is true, there is a positive effect on society?" [Participants saw a slider labeled 0, "A positive effect on society has nothing to do with why this statement is true" to 100, "A positive effect on society has a lot to do with why this statement is true"].

### **Testimony**

"Sometimes, in order to believe a statement is true, we need to trust what someone else told us. For example, if your friend tells you that someone has been saying mean things about you behind your back, then you'll probably believe your friend because you trust your friend.

However, sometimes we believe what people tell us without needing to trust them. For example, when you ask a complete stranger what time it is, the stranger looks at their watch and then tells you the time. You believe the stranger, but there is almost no trust required to believe the stranger.

In Part 1 you indicated that you were highly certain that the statement below is true. How much trust in other people is required in order to believe this statement is true?

[A statement from Part 1 appeared here].

Question 4: How much trust in other people is required in order to believe this statement is true? [Participants saw a slider labeled 0, ‘No trust required’ to 100, ‘High level of trust required’].

Question 5: Imagine that a person grew up in a place where there was no information available about the statement below. This person never received any information about the statement below, before the age of 25. Then, at the age of 25, this person learned information relevant to the statement below. How likely do you think it is that this 25-year-old person would believe the statement below is true?”

[A statement from Part 1 appeared here].

[Participants saw a slider labeled 0, “Extremely unlikely” to 100, “Extremely likely”].

### **Justification vs. Faith**

“People have different reasons for believing what is true. Sometimes, people believe that a statement is true because they believe that they can justify that the statement is true. According to this perspective, if the statement cannot be justified, then it is not true.

In contrast, sometimes people believe that a statement is true without needing to believe that they can justify that the statement is true. According to this perspective, even if the person cannot justify that the statement is true, the person still believes the statement is true.

In Part 1 you indicated that you were highly certain that the statement below is true. To what extent do you need justification in order to believe the statement below is true?

[A statement from Part 1 appeared here].

Question 6: To what extent do you need justification in order to believe the statement is true?" [Participants saw a slider labeled 0, "Completely do not need justification" to 100, "Completely need justification"].

### **6.3 Results**

In Part 1 of the study, some participants did not indicate that they were highly certain that any statement was true for at least one domain. It was preferable to have at least one data point for each participant for each domain, so these participants were excluded from the analyses leaving a remaining 98 participants (63 males).

Participants could see the same question up to two times per domain (for up to two statements per domain). For all the questions with sliders, the mean response was calculated for each question, each participant, and each domain. To compare across domains, these mean response values were entered into repeated measures ANOVAs. The independent variable for each ANOVA was the domain, and the dependent variable was the mean slider response (see Table 6 for means and ANOVA results).

**Table 6.** Theories of truth/justification, mean slider responses, and *p* values from ANOVA tests – Study 5

Question	Political Mean (SE)	Religious Mean (SE)	Factual Mean (SE)	<i>F</i>	<i>p</i> values from comparisons		
					Political vs. Religious	Political vs. Factual	Religious vs. Factual
Correspondence	21.68 (2.24)	57.60 (3.47)	56.34 (3.79)	71.74	***	***	1
Coherence	75.72 (2.32)	72.03 (2.78)	85.55 (2.26)	12.54	0.71	**	***
Pragmatic	61.97 (3.14)	39.77 (3.50)	26.92 (3.18)	40.27	***	**	***
Trust	48.76 (3.15)	43.18 (3.77)	23.63 (2.84)	26.61	0.606	***	***
Indoctrination	63.24 (2.62)	62.1 (2.96)	81.64 (2.51)	21.78	1	***	***
Justification	56.03 (3.16)	38.85 (3.53)	33.09 (3.54)	15.81	***	***	0.616

*Note.* The question column displays a summary of the question or prompt that the participants saw. The political mean, religious mean, and factual mean columns show the means of the mean slider responses to each question for each domain. *df* for all ANOVAS were (2, 96). \* *p* <.05; \*\* *p* <.01; \*\*\* *p* <.001.

## 6.4 Study 5 Discussion

Hypothesis 5A was not supported. Participants responded that they relied on correspondence mostly for political truth followed by factual/religious. This result unfortunately does not offer concrete evidence for an alternative explanation. However, one suggestion is that laypeople do not think about correspondence when defining why their beliefs are true. As discussed above, the concept of correspondence can seem too obvious such that it's circular and confusing, especially to laypeople. The abstruse nature of correspondence might preclude its intuitive functionality in laypeople. Given the results of Study 3, however, it seems likely that some lay version of correspondence is used for all kinds of observable, verifiable facts.

However, explicit access to this epistemological principle may be limited. To explain why political statements received the highest ratings, one guess is that participants focused on the mention of “events or circumstances in the world,” in the instructions. Philosophers often refer to the “world” as meaning simply everything in existence, and “events” as meaning anything that occurs. But it is possible that participants associated the “world” with locations outside the U.S., as in “world news,” and “events” with something like “current events,” which are often political. This putative confusion about the meaning of these terms then would be a reason for why they responded that “events in the world” were the basis for their political beliefs, but less so for their religious or factual beliefs.

Hypothesis 5B was supported: Participants responded that their factual beliefs cohere with other truths more than religious/political beliefs. It was possible that people might represent exceptions to rules as a way of avoiding inconsistency. For example, consider the statement, “Jesus walked on water without sinking.” A believer could say, “Walking on water is impossible but because Jesus was divine, he was able to do it.” By making this type of exception, a believer could therefore reason that all of these propositions cohere perfectly. But it appears that instead, laypeople think of religious/political beliefs as being less consistent than factual beliefs with other knowledge.

Hypothesis 5C was supported. Philosophers who consider themselves pragmatists define a proposition to be true when it functions best for a particular purpose (e.g., propositions about the nature of a medication are true if the medication cures disease). In Study 5, a lay version of the pragmatic theory was tested in which participants were asked if their belief is true because when people believe it is true then society works better. Participants attributed their belief that

both religious and political statements were true to this version of pragmatism, more than they did for factual beliefs. The effect was greatest for the political domain. This finding does not present a problem for the interpretation of the results, but a difference between religious and political domains was not predicted. It may be that the word “society” and the example of voting in elections in the instructions caused participants to think about political repercussions the most, even though the question did not intend to have participants focus on the political consequences of belief.

In academic epistemology, philosophers often are interested in the extent to which we can rely on the testimony of others as a source of knowledge. Questions 4 and 5 were designed to test the extent to which trust in authority and indoctrination are the sources for belief in the political, religious, and factual domains. Hypothesis 5D was supported. Participants responded that they rely more on trust in what others told them, in order to believe political and religious statements, compared to factual statements. Hypothesis 5E also was supported. Participants responded that the likelihood of belief, if the relevant information was only discovered after the age of 25, would be lower for political and religious statements compared to factual statements. Both of these findings are consistent with the idea that people are more likely to have acquired their political and religious beliefs from others, particularly at a young age, as opposed to having acquired them from observation, verification, and evidentialism.

Hypothesis 5F was not supported. Participants responded that they needed to justify political statements the most followed by religious/factual, which were not significantly different from each other. Question 6 was intended to test how participants use justification for their beliefs in the political, religious, and factual domains. The predicted result was that participants

would say that religious statements needed less justification because they can be known through faith. But this prediction, surprisingly, was not confirmed. By asking participants if their beliefs “need” to be justified in order to be true, question 6 was supposed to cause participants to reflect on which types of beliefs can be true without justification. While it cannot be known for sure, one possible explanation is that phrasing the question this way may have caused participants to think about when they felt they “needed” to justify these beliefs to other people in real-life conversations. Under this interpretation, participants may have envisioned a political debate as the only instance in which they would likely need to produce justification for their beliefs. Furthermore, it may have sounded strange to think about “needing” to justify an obvious fact like “Coca Cola is a brand of soda,” for example.



## **Chapter 7: Study 6 – Objectivity**

Study 6 investigated the concept of objectivity. Similar to previous studies (Goodwin & Darley, 2008, 2012), Study 6 looked at the extent to which people feel that their beliefs are objectively versus subjectively true across different domains. When people feel their belief is objectively true, that means it is true for everyone, and anyone who disagrees with them is mistaken. Alternatively, when someone feels their belief is subjectively true, that means it is true for them, and yet it is possible for others to hold opposing, subjectively true beliefs. Therefore, if someone disagrees, then that person may not necessarily be mistaken. A third dimension, nihilism also was explored. If a believer is nihilistic about a proposition, then she doesn't think it is possible to say whose perspective is correct in the event of a disagreement. The proposition is not objectively true for everyone nor is it subjectively true for each individual.

It was predicted that participants would find factual statements to be the most objectively true, followed by religious/political statements. This was predicted because factual propositions are based most clearly on universal, normative, epistemological standards. It also was predicted that participants would be most nihilistic about religious statements followed by political and then factual statements. This was predicted because religious propositions violate normative epistemological standards the most and therefore, in the case of a disagreement, establishing who is correct is very difficult or impossible.

Study 6 also explored tolerance of disagreement. How do people feel about those who disagree with them across the three domains? Disagreement was used as a window into how people think about the nature of their own beliefs. For example, it was predicted that people would rate those who disagreed about facts as lower on intelligence and reasonableness

compared to those who disagreed about political and religious statements. The rationale behind this prediction was that people feel that belief in facts depends on an intelligent, reasonable appreciation of reality whereas belief in political or religious propositions does not. Laypeople understand that political and religious propositions are not based on universal, objectively true pieces of evidence, but rather on other influences (for example, one's group affiliation). Therefore, holding an opposing political or religious belief wouldn't say anything about one's intelligence or reasonableness.

Conversely, it was predicted that holding an opposing political or religious view would signal an immoral nature, whereas holding an opposing factual view would signal nothing about a person's morality. Because opposing religious and political views signal one's outgroup affiliation, and because people denigrate outgroup members, it was predicted that participants would rate political and religious opponents as lower on moral qualities and as less desirable to interact with socially.

## **7.1 Hypotheses**

Hypothesis 6A: Participants will select choice A, that the person who disagrees with them is mistaken, more often when responding to factual statements and less when responding to political/religious statements. Choice B, that neither person is mistaken in the case of disagreement, will be selected most for political statements followed by religious and then factual statements. Choice C, that it is impossible to say who is right in the case of a disagreement, will be selected most frequently in response to religious statements, followed by political and then factual statements.

Hypothesis 6B: Participants will rate those who disagree with factual statements lower on intelligence and reasonableness, followed by those who disagree on political and then religious statements. Participants will rate those who disagree on political/religious statements lower on moral qualities like goodness, fairness, honesty, and kindness, but higher on dogmatism, compared to those who disagree on factual statements.

Hypothesis 6C: Participants will be more opposed to being friends with, dating, and being roommates with political and religious opponents than with factual opponents.

## **7.2 Method**

### **7.2.1 Participants**

161 Americans (106 males) over the age of 18 (mean age = 41.25 years old), recruited from MTurk workers, completed the study.

### **7.2.2 Procedure and Measures**

After completing Part 1, participants were presented with the following instructions along with each of the statements selected from Part 1. The statements were presented in random order, but for each statement, participants first saw the objectivism versus subjectivism question and next saw the tolerance questions (as they are written below).

Objectivism versus subjectivism.

Question 1: “Please read the following statement. Then answer the question below about this statement.

[A statement from Part 1 appeared here].

Your previous response indicated that you are highly certain that the statement above is true. Imagine someone who disagrees with you about the statement above. This person thinks the statement above is definitely false. Please choose the option that most closely represents how you feel about the disagreement between you and this person:

- A) The person who disagrees with me is mistaken.
- B) Neither one of us is mistaken, we could both be correct.
- C) It is impossible to say who is right or wrong.”

Choice A was meant to capture objectivism/absolutism. Choice B was meant to capture subjectivism/relativism. Choice C was meant to capture something like a lay version of nihilism.

Tolerance versus intolerance.

“Please read the following statement. Then answer the questions below about this statement.

[A statement from Part 1 appeared here].

Your previous response indicated that you are highly certain that the statement above is true. Imagine someone who disagrees with you about the statement above. This person thinks the statement above is definitely false.

Question 2: Think about the person who thinks the statement above is false. What kind of person do you imagine he/she is? Please rate this person on the following traits. [Participants saw separate sliders for intelligent, morally good, fair, honest, dogmatic, reasonable, kind].

Think about the person who thinks the statement above is false. How opposed would you be to each of the following?

Question 3: How opposed would you be to being friends with this person?" [Participants saw a slider from 0, 'Not opposed at all' to 100, 'Extremely opposed.']

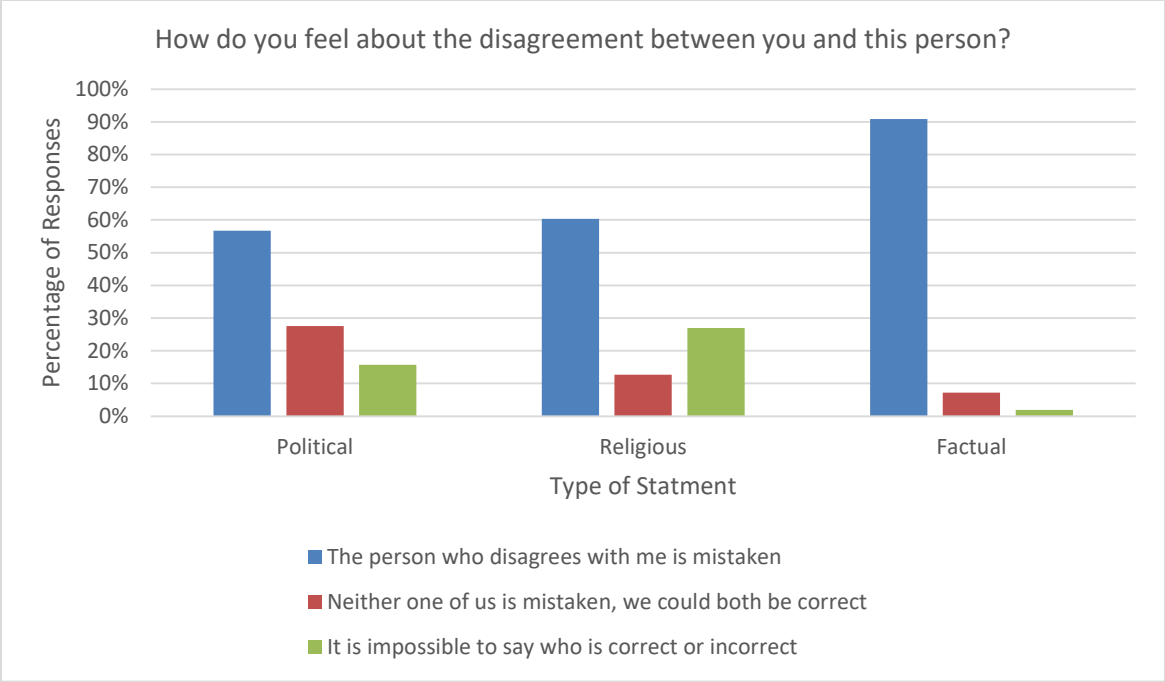
Question 4: How opposed would you be to dating this person? [Participants saw a slider from 0, 'Not opposed at all' to 100, 'Extremely opposed.']

Question 5: How opposed would you be to being roommates with this person?" [Participants saw a slider from 0, "Not opposed at all" to 100, "Extremely opposed."]

### **7.3 Results**

In Part 1 of the study, some participants did not indicate that they were highly certain that any statement was true for at least one domain. It was preferable to have at least one data point for each participant for each domain, so these participants were excluded from the analyses, leaving 104 participants (74 males).

For question 1, participants were most objective about factual statements (as predicted), followed by religious followed by political statements. As may be seen in Figure 5, participants were most subjective about political statements followed by religious followed by factual, and most nihilistic about religious statements followed by political followed by factual statements. Results from a chi-square test of independence revealed a significant difference among domains (chi square = 90.361,  $df = 4$ ,  $p < .0001$ ). All pairwise comparisons were significantly different: Political vs. religious chi square = 15.73,  $df = 2$ ,  $p < .001$ ; political vs. factual chi square = 60.80,  $df = 2$ ,  $p < .0001$ ; factual vs. religious chi square = 60.03,  $df = 2$ ,  $p < .0001$ ).



**Figure 5:** Responses to objectivity question

Just as in the previous studies, the responses to the slider questions were averaged and the mean responses were entered into a repeated measures ANOVA in which the independent variable was the domain and the dependent variable was the slider responses. (For results of the ANOVA tests see Table 7.)

**Table 7.** Questions and results from ANOVA tests – Study 6

Question	Political Mean (SE)	Religious Mean (SE)	Factual Mean (SE)	<i>F</i>	<i>p</i> values from comparisons		
					Political vs. Religious	Political vs. Factual	Religious vs. Factual
How intelligent is this person?	42.73 (2.41)	43.18 (2.73)	18.79 (2.21)	43.79	1	***	***
How morally good is this person?	45.33 (2.45)	49.47 (2.40)	50.64 (2)	3.15	.181	.067	1
How fair is this person?	44.56 (2.40)	48.74 (2.26)	45.39 (1.93)	2.17	.145	1	.461
How honest is this person?	52.24 (2.38)	52.96 (2.53)	45.07 (2.24)	5.99	1	**	**
How dogmatic is this person?	56.72 (2.28)	59.50 (2.69)	52.41 (2.22)	3.45	.753	.154	*
How reasonable is this person?	39.59 (2.18)	41.54 (2.52)	27.34 (2.40)	14.85	1	***	***
How kind is this person?	48.35 (2.46)	52.64 (2.03)	50.61 (1.92)	2.17	.119	.934	.940
How opposed would you be to being friends with this person?	31.75 (3.20)	29.92 (3.10)	40.42 (3.32)	4.68	1	*	*
How opposed would you be to dating is this person?	50.34 (3.60)	56.90 (3.49)	58.56 (3.65)	3.29	.149	.076	1
How opposed would you be to being roommates with this person?	39.89 (3.48)	39.15 (3.66)	47.58 (3.36)	2.71	1	.099	.115

*Note.* The question column displays a summary of the question or prompt that the participants saw. The political mean, religious mean, and factual mean columns show the means of the mean slider responses to each question for each domain. *df* for all ANOVAS were (2, 112). \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

## 7.4 Study 6 Discussion

Hypothesis 6A was supported. The largest percentage of participants responded that factual statements were objectively true, followed by religious followed by political statements.

The reverse pattern was true for which statements were most subjective. The greatest percentage of nihilistic responses corresponded to religious statements, followed by political followed by factual statements, as predicted.

Hypotheses 6B and 6C were mostly unsupported. As predicted, participants responded that those who disagreed with them about factual statements were less intelligent and less reasonable compared to those who disagreed about political or religious statements. This finding supports the argument that people do not think of religious and political truth as normative, reasonable, or the result of intelligent comprehension of reality.

Responses about an opponent's goodness, fairness, or kindness, however, showed no significant differences across domains. Interestingly, participants responded that someone who disagreed about factual statements was less honest, possibly because they thought anyone who said obviously true facts were false would have to be lying. In addition, the responses to the questions about being friends, dating, or being roommates were also not as predicted. The only significant difference was that participants said they would want to be friends least with someone who disagreed about facts – again probably because participants figured someone who thought obviously true facts were false would have to be lying or somehow impaired.

One possibility for this pattern of findings is that people view intolerance as immoral. Judging an outgroup member poorly or refusing to socialize with them could be viewed as a form of bigotry in oneself. The entire set of predictions revolved around people's propensity to denigrate the outgroup. This manipulation either failed to provoke a negative reaction towards the outgroup, or participants did not want to reveal prejudiced feelings towards others.



## **Chapter 8: Study 7 – Features of Uncertainty**

Study 7 explored beyond academic principles to investigate more intuitive ideas related to knowledge. Several concepts were chosen for investigation. These concepts were chosen to illuminate different dimensions of overall certainty and nature of belief. In Part 2 of Study 7, participants were asked to consider the religious, political, and factual statements that they had indicated were certainly true in Part 1. Participants were asked how much effort was required to believe that the statement was true, how obvious that truth was, how reasonable belief was, how frequently they doubted the truth of the statement, and whether they would say they “believed” versus “knew” the statement was true. Each of these questions captured a different intuitive piece of overall certainty and belief. By asking about certainty indirectly, the design aimed to more accurately assess participants’ intuitions.

In Study 7, people also were asked to think about another person who disagreed with them. Rather than report how they tolerated this other person (as was done in Study 6), participants were asked to report how they would feel listening to counterarguments against their religious, political, and factual beliefs. Asking participants to react to counterarguments was yet another, indirect method of revealing their intuitions about their own beliefs. Participants also were asked to evaluate the qualities of the counterarguments and say whether they would avoid listening to them.

It was predicted that participants would report that religious and political statements required more effort to believe, were less obviously true, and were less reasonable to believe than factual statements. It was predicted that participants would report that they doubted religious and political beliefs more often than factual ones, and that they “believed” religious and

political statements, and “knew” factual statements were true. The rationale for these predictions was that people are less certain that religious/political propositions are true compared to factual ones, at least in the sense that “true” equates to tracking reality. To the extent that “true” means something else (e.g., signaling group membership or signaling features about oneself), Study 7 did not offer any evidence. “Believe” and “know” were assumed to have slightly different meanings to participants. Both words refer to accepting that a proposition is true. However, “believe” allows for more subjectivity (as in a “personal belief”) and depends less on an objective representation of reality. “Know,” conversely, has more of an objective, universally true connotation that refers to tracking reality based on normative standards.

When asked how they would feel listening to counterarguments, it was predicted that participants would be more likely to experience negative emotions (anger, offense, disgust, and guilt) in reaction to religious/political counterarguments whereas they would be more likely to feel confusion and surprise towards factual counterarguments. The rationale for this prediction was that negative emotions occur when one feels their political/religious identity is threatened by a counterargument. Negative emotions do not make sense if one finds the counterarguments to be obviously untrue. Surprise and confusion, however, make sense when one finds the content of the counterarguments to be obviously untrue. As a control, participants were asked about some additional emotional states, such as happiness and fear. It was predicted that there would be no difference in happiness and fear levels across domains.

It was predicted that participants would find religious/political counterarguments more valuable, more predictable, more logical, and would avoid them more than factual counterarguments. The rationale here was that people are aware that their religious and political

beliefs do not always track reality and can be exposed as untrue by well-reasoned counterarguments. For example, if one believes that Jesus' mother, Mary, was a virgin when she gave birth to Jesus, one might accept that counterarguments would be logical, predictable, and reasonable. Avoiding these counterarguments could be a way to minimize the negative experience of confronting conflicting representations of truth.

The overall goal of Study 7 was to provide a window into the nature of certainty of truth from several different angles. If all of the different dimensions of belief showed the predicted domain differences in Study 7, it would offer strong support for the view that people do not think political and religious propositions as tracking reality the same way they think factual propositions do.

## **8.1 Hypotheses**

Hypothesis 7A: Participants will report that factual statements are the most obviously true, followed by political, followed by religious statements.

Hypothesis 7B: Participants will be most certain that a reasonable other person would agree with them about the truth of factual statements, followed by political, followed by religious statements.

Hypothesis 7C: Participants will respond that religious statements require the most effort, commitment, and dedication to believe, followed by political, followed by factual statements.

Hypothesis 7D: Participants will say they have doubted religious beliefs the most, followed by political, followed by factual.

Hypothesis 7E: A greater percentage of participants will respond that they “believe” religious statements compared to political statements, and the lowest percentage will respond

that they “believe” factual statements. The pattern for “knowing” statements are true will be the reverse.

Hypothesis 7F: Participants will be more angry, mad, offended, guilty, and disgusted by the prospect of someone saying their religious belief is untrue, followed by political, followed by factual beliefs. Furthermore, disagreements over factual statements will have almost no emotional effects whereas those over religious and political disagreements will. Participants will feel more surprised and confused when someone says a fact is definitely untrue, compared to when someone says a political or religious statement is untrue.

Hypothesis 7G: Participants will respond that arguments against their religious beliefs are most predictable and say they make the most logical sense, followed by arguments against political and then factual beliefs. Participants will rate arguments against their factual beliefs lower on value and interestingness compared to political and religious counterarguments. Participants will say they would avoid religious and political counterarguments more than they would avoid factual counterarguments.

## **8.2 Method**

### **8.2.1 Participants**

160 American participants (101 male) over the age of 18 (mean age 41.34), recruited from MTurk, participated in the study.

### **8.2.2 Procedure and Measures**

As with the previous studies, participants completed Part 1 and then were presented with statements that they had rated as at least 85 on the scale of certainly true. In Part 2, along with

each statement, participants were presented with the following questions in random order.

Participants responded to all questions using a slider depicting words but not numbers, except question 4 which required them to choose between ‘believe’ and ‘know’.

Question 1: “Sometimes it is very obvious that a statement is true. For example, it is very obvious that  $1+1 = 2$ . Other times, a statement is true but it is not so obvious. For example, solid objects are composed of invisible atoms, but it is not so obvious that that is true. Please rate how obvious it is that the statement above is true. (Please note, we are not asking how true the statement is, but rather, how obvious it is that the statement is true.)

Question 2: Once we determine some statements are true, we never again consider the possibility that they might be false. For example, at some point in your life you learned that our planet is called “Earth” and you probably never wondered whether this was false – you simply accepted it and never thought about it again. However, for some statements, we determine they are true but sometimes wonder if they might be false (even though we still think they are true). For example, you probably learned that many, many years ago, before the beginning of time, there were no planets, light, or any physical matter at all. Even though you believe this is true, you might wonder sometimes if it is false. Think about the statement above. How frequently have you wondered about the possibility that it might be false (even though you still think it is true)?

Question 3: Imagine another person. This person is a reasonable person who has the same education level that you have. How certain are you that this person would think that the statement above is true? (Please note, we are not asking how certain you are that the statement is true, but rather, how certain you are that the other person would think the statement is true.)

Question 4: Some statements we believe are true while other statements we know are true. Please select the option that most accurately describes how you feel about this statement:

- a. I *believe* this statement is true
- b. I *know* this statement is true

Question 5: For some statements, it requires effort, commitment, or dedication to believe they are true. However, for other statements, it is automatic and effortless to believe they are true. Think about the statement above. How much effort, dedication, or commitment does it require to believe the statement above is true?

In Part 1, you indicated that you are highly certain that the statement above is true. Now please imagine a person who disagrees with you. This person has thought about the statement above and decided that it is definitely false. Please answer each of the following questions:

Question 6: If you listened to this person talk about why they think this statement is false, how do you think that would make you feel? [Here participants saw separate sliders, one for each of the following: angry, sad, mad, happy, disgusted, scared, surprised, confused, offended, guilty].

Question 7: Imagine this person's arguments about why you are wrong. Use the sliders below to indicate how much you agree with each of the following statements:" [Here participants saw separate sliders, one for each of the following: these arguments would be valuable for me to hear; these arguments would be predictable; these arguments would be interesting; these arguments would make logical sense; I would avoid hearing these arguments].

### **8.3 Results**

In Part 1 of the study, some participants did not indicate that they were highly certain that any statement was true for at least one domain. It was preferable to have at least one data point for each participant for each domain, so these participants were excluded from the analyses leaving a remaining 114 participants (69 males).

Participants could see the same question up to two times per domain (for up to two statements per domain). For all the questions with sliders, the mean response was calculated for each question, for each participant, in each domain. To compare across domains, these mean response values were entered into repeated measures ANOVAs. The independent variable for each ANOVA was the domain, and the dependent variable was the mean slider response. In some cases, the difference between political/religious statements was not in the predicted direction, and/or not significant, but the predicted direction of the factual domain was observed in nearly all cases (see Table 8).

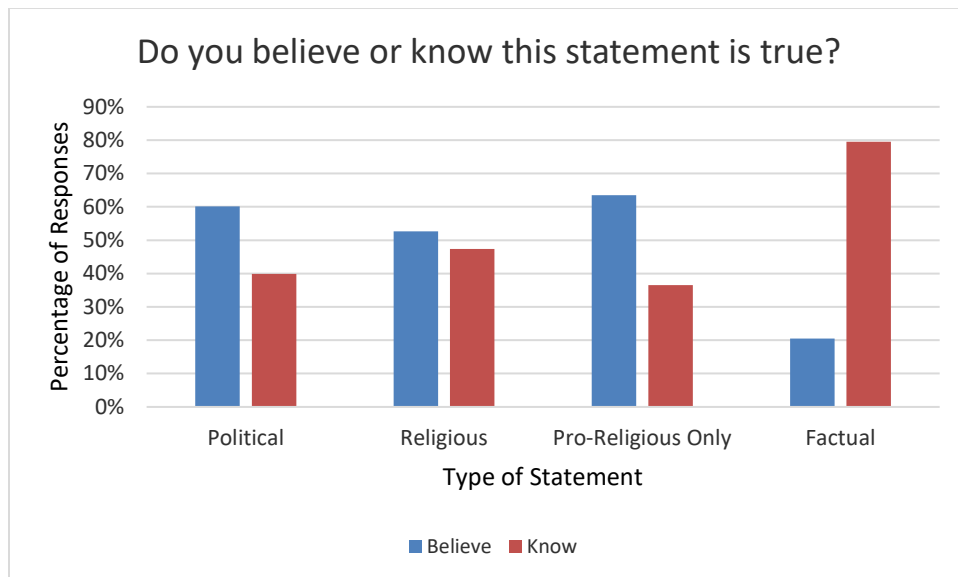
**Table 8.** Questions, mean slider responses, and *p* values from ANOVA tests – Study 7

Question	Political Mean (SE)	Religious Mean (SE)	Factual Mean (SE)	<i>F</i>	<i>p</i> values from comparisons		
					Political vs. Religious	Political vs. Factual	Religious vs. Factual
Is the truth obvious?	58.67 (2.36)	59.73 (3.06)	86.16 (1.94)	66.73	1	***	***
Would another reasonable person believe this?	59.57 (2.27)	53.70 (2.53)	86.78 (2.12)	53.35	0.118	***	***
How much effort to believe?	35.72 (2.60)	35.50 (3.04)	12.16 (2.15)	83.77	1	***	***
How frequently do you doubt?	29.76 (2.24)	25.57 (2.50)	7.14 (1.69)	53.36	0.411	***	***
Listening to a non-believer - Angry?	30.99 (2.90)	17.88 (2.57)	15.63 (2.34)	17.33	***	***	1
Listening to a non-believer - Sad?	24.23 (2.52)	30.05 (3.05)	21.03 (2.80)	3.08	0.222	0.94	*
Listening to a non-believer - Mad?	30.81 (2.94)	16.19 (2.31)	14.16 (2.20)	18.13	***	***	1
Listening to a non-believer - Happy	4.46 (1.24)	7.82 (1.92)	6.12 (1.46)	1.44	0.284	0.76	0.914
Listening to a non-believer - Disgusted?	31.29 (3.03)	14.82 (2.34)	20.12 (2.75)	17.80	***	**	0.156
Listening to a non-believer - Scared?	14.50 (2.21)	11.21 (2.10)	11.11 (1.94)	1.81	0.337	0.315	1
Listening to a non-believer - Surprised?	31.59 (2.78)	26.09 (2.81)	63.36 (3.42)	53.24	0.106	***	***
Listening to a non-believer - Confused?	21.61 (2.57)	18.99 (2.53)	43.48 (3.42)	26.44	0.585	***	***
Listening to a non-believer - Offended?	23.45 (2.77)	14.84 (2.28)	8.89 (2.01)	12	**	***	0.058
Listening to a non-believer - Guilty?	3.18 (.87)	3.24 (.97)	2.43 (.89)	2.32	1	0.884	0.139
Counterarguments would be Valuable	51.11 (2.90)	37.15 (3.10)	22.30 (2.37)	48.12	***	***	***
Counterarguments would be Predictable	61.79 (2.59)	68.13 (2.72)	24.92 (2.50)	76.81	0.162	***	***
Counterarguments would be Logical	35.56 (2.25)	26.50 (2.37)	16.79 (2.04)	25.68	**	***	**
I would avoid counterarguments	37.83 (2.90)	47.68 (3.06)	43.07 (3.30)	4.65	**	0.372	0.52
Counterarguments would be Interesting	47.65 (2.83)	36.28 (2.96)	49.18 (3.18)	7.22	**	1	**

*Note.* The question column displays a summary of the question or prompt that the participants saw. The political mean, religious mean, and factual mean columns show the means of the mean slider responses to each question for each domain. *df* for all ANOVAS were (2, 112). \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .



For the “believe vs. know” question, participants responded more frequently that they ‘know’ factual statements whereas they ‘believe’ political and religious statements (see Fig. 6). Religious statements included eight “pro-religious” statements and two “anti-religious” statements. In Figure 6 (but not in the accompanying chi square analyses), the pro-religious statements are presented separately, showing even more of an effect of domain. A chi-square test of independence revealed a significant difference between domains (chi square = 69.12,  $df = 2$ ,  $p < .0001$ ). Pairwise comparisons were as follows: Political vs. religious chi square = 2.19,  $df = 1$ ,  $p = .12$ ; political vs. factual chi square = 61.84,  $df = 1$ ,  $p < .0001$ ; factual vs. religious chi square = 44.47,  $df = 1$ ,  $p < .0001$ ).



**Figure 6:** Frequencies of “believe” vs. “know” responses

## 8.4 Study 7 Discussion

Hypotheses 7A-7E were supported. Specifically, participants responded that factual truth is more obvious than political/religious truth; that factual truth is more reasonable than

political/religious truth (by saying that a reasonable person would be more likely to believe factual statements); that religious/political truth requires more effort, commitment, and dedication to believe than factual truth; that they doubt political/religious truth more often than they doubt factual truth; and that they mostly “believe” religious/political statements whereas they mostly “know” factual statements.

Hypothesis 7F was partially supported. Participants typically responded that they would experience more negative emotions (such as anger, sadness, offense, and disgust) in the face of political/religious counterarguments. This finding suggests that participants don’t necessarily find counterarguments to be false, but rather find them to be upsetting because of their political or religious implications. In addition, participants said they would be more surprised and confused by factual counterarguments. This finding suggests that participants find factual counterarguments to be more certainly false and inconsistent with reality. It can be inferred from this finding that participants think of factual truth as more certainly true and consistent with reality compared to religious and political truth.

However, no significant difference was observed in reported levels of guilt across domains when imagining listening to counterarguments. The hypothesis that participants would feel more guilty if listening to counterarguments in the political and religious domains was based on the idea that political and religious beliefs signal coalition affiliation. Entertaining counterarguments in these domains might, therefore, feel like a form of betrayal against one’s group and cause one to feel guilty. It is possible that participants didn’t interpret the question as asking about engaging with or considering the validity of counterarguments, which might lead to

guilt but rather, participants interpreted the question as asking about simply hearing someone else say a counterargument.

Hypothesis 7G was partially supported. Participants responded that political/religious counterarguments are more valuable, predictable, and logical than factual counterarguments. This finding suggests that people are aware of convincing, strong arguments against their political/religious beliefs but not against their factual beliefs. Some of the observed results were not predicted. Participants responded that religious counterarguments would be less interesting than political or factual counterarguments, and that they would avoid factual and religious counterarguments more than political.

Taken together, the findings from Study 7 strongly support the argument that people think of religious and political truth differently than they think of factual truth. Religious and political truth is less obvious, less reasonable, more effortful to believe, more dubious, and less “known.” Hearing counterarguments against religious/political knowledge is more likely to cause negative emotions like anger and disgust – a reaction that does not clearly follow if one believes the counterarguments are clearly false. Conversely, counterarguments against factual knowledge cause surprise and confusion, which makes sense if one believes that the counterarguments are clearly false. Furthermore, counterarguments against religious/political knowledge are reported to be more valuable, predictable, and logical.

## **Chapter 9: General Discussion**

The current research examined folk epistemology in laypeople, that is, laypeople's intuitions and thoughts about their own knowledge. Several principles from academic epistemology (e.g., verification, falsification, theories of truth, testimony) were examined along with other concepts surrounding intuitions about knowledge (e.g., certainty, doubt, objectivity, tolerance of disagreement). In conjunction with this exploration, three domains of knowledge, political, religious, and factual, were evaluated for hypothesized folk epistemological differences. This research illuminated intuitive epistemology, showing for the first time how laypeople think about a variety of epistemological concepts in relation to their own beliefs. In addition, several hypotheses were supported, demonstrating the unique intuitive epistemological standards underpinning religious and political belief. Taken together, these findings show that laypeople think of religious and political truth in a different sense than factual truth. Laypeople rely less on normative epistemological principles when explaining how and why their political and religious beliefs are true. If "truth" is taken to mean purely tracking reality, then these findings suggest that people are less certain about political and religious truth compared to factual.

### **9.1 Summary of Purpose and Goals**

The overall purpose of the research was to describe how laypeople intuitively think about various epistemological concepts in relation to their own beliefs. Another goal was to investigate whether, as hypothesized, laypeople depart from normative epistemology when thinking about why their religious and political beliefs are true.

Religious and political knowledge were of interest because (i) folk epistemology in these domains has been underexplored (ii) beliefs in these domains, unlike in other domains, have major social consequences, resulting in a unique motivational landscape related to belief, and (iii) content in these domains often involves clear departures from academic, normative epistemology and is identified as obviously false by non-believers.

Factual knowledge was of interest because it offered a window into “default” folk epistemology. That is, intuitions about factual knowledge represent how laypeople think about straightforward, everyday truth, and thereby offer a comparison against which to understand individuals’ religious and political folk epistemology.

## **9.2 Summary of Findings**

Study 1 showed that people can reliably categorize propositions as belonging to religious, political, and factual categories. Participants’ ability to categorize statements consistently into the intended domains provided the basis for determining which statements best represented the target domains to most people. Study 2 validated the statements that were to be used in studies 3-7 and also showed that people find religious and political uncertainty more difficult to resolve than factual uncertainty. This difference in resolvability of uncertainty was evidence supporting the argument that political and religious truth is of a different nature than factual truth.

Studies 3-7 examined various epistemological concepts in laypeople, testing the differences among religious, political, and factual beliefs in each study. Study 3 tested verification and found a huge difference in how people think about the verifiability of religious, political, and factual statements. Nearly everyone said they could verify their factual beliefs whereas less than half reported their religious beliefs to be verifiable. Participants located the

verifiability of political beliefs between the other two domains. On average, participants responded that the best way to establish truth involves verification, and the best proof of truth is evidence in the world. However, religiosity correlated negatively with both valuing verification and observable evidence as means of establishing truth. Religiosity and political orientation did not correlate with whether one thought statements were verifiable.

Study 4 tested falsification. Less than a third of participants responded that their religious beliefs were falsifiable whereas most responded that factual and political beliefs were. On average, participants were moderately in agreement that falsification is required in order to determine truth. Religiosity and political orientation didn't correlate with whether one thought statements were falsifiable.

Study 5 investigated theories of truth derived from academic epistemology along with other reasons for one's belief. On average, participants reported that the coherence theory of truth was less of a basis for their religious and political beliefs compared to factual. The reverse pattern was found for the pragmatic theory of truth. Trust in the testimony of others and indoctrination were found to be more important for acquiring religious and political knowledge compared to factual. Coherence theory was favored more than any of the other theories of truth across all three domains of knowledge. Participants seemed to struggle with the meaning of correspondence theory, rating it the most related to political beliefs but less involved in determining religious or factual truth.

In Study 6, participants reported that factual truth was the most objective, political truth the most subjective, and religious truth the most nihilistic (i.e., it was impossible to say whether religious truth was subjective or objective). People reported feeling negative emotions when

reflecting on religious and political counterarguments whereas they reported feelings of surprise and confusion in the face of factual counterarguments.

Study 7 examined a variety of concepts surrounding intuitions about knowledge. On average, participants responded that factual truth is more obvious, more reasonable, more effortless to believe, less dubious, and more “known” than religious and political truth.

### **9.3 Implications**

At the most basic level, these findings reveal much about folk epistemology that was previously unknown. Principles from academic epistemology were investigated for the first time in laypeople along with a variety of intuitive concepts (like frequency of doubt, reasonableness of truth, and judgements of counterarguments). Overall, the approach taken here illuminated many features of belief that have been unstudied.

The deeper connection to previous research however, lies in the folk epistemological domain differences identified. Throughout the history of the study of folk epistemology, questions about domain generality versus specificity have persisted. Some scholars have found evidence for domain-general trends (Schommer & Walker, 1995; Schommer-Aikins et al., 2003), but many others have increasingly demonstrated domain specificity in folk epistemology (Muis et al., 2006). That is, intuitive perspectives about knowledge along a variety of dimensions have been found to differ according to the type of knowledge.

The current research is the first systematic investigation of the folk epistemology of ideological beliefs (religious and political). These domains have largely been ignored by those studying folk epistemology despite their compelling and extreme domain differences. Much of the previous work on domain specificity of folk epistemology has been motivated by an interest

in learning, education, and development. Thus, “domain” has often been taken to mean academic discipline, like psychology, hard sciences, or history (Buehl et al., 2002; Hofer, 2000).

Amidst the debate about domain differences, the framework depicted in Table 1 (Kuhn et al., 2000) emerged as a relatively popular unification of theories and findings. On the domain-general side, a reliable shift from absolutist through multiplist, and then finally to evaluativist seems to occur across at least several domains studied. On the domain-specific side, however, the rate at which this developmental trajectory occurs, varies according to the specific domain of knowledge.

But does this framework suffice for the religious and political domains? Although the present research did not investigate developmental stages, the current findings suggest that lay perspectives about religious and political beliefs do not fit into the Kuhn et al. (2000) framework. According to Kuhn et al., adults reach the evaluativist stage, characterized by an appreciation for well-reasoned arguments and evidence. Critical thinking is valued as a means for achieving understanding.

Adults’ responses to the epistemological questions with respect to factual statements, indeed, were consistent with the evaluativist perspective. On average, participants indicated that they relied on verification, observable evidence in the world, and logical coherence for factual statements. If the evaluativist stage were truly domain general, that is, if the characteristic perspectives towards knowledge occurred for all types of knowledge, then participants would have responded to the religious and political statements similarly to how they responded to factual statements. Responses regarding religious and political knowledge, however, bore no



resemblance to evaluativism. Religious and political beliefs were said to be true with less or little reliance on reason or evidence.

In order to compare the evaluativist perspective to the intuitions underlying religious and political beliefs, consider the religious proposition, “Jesus walked on water without sinking.” For someone who rated the proposition as ‘very certainly true,’ the findings of the current research show that this person could simultaneously value verification and falsification yet find this proposition to be unverifiable and unfalsifiable. She could sometimes doubt whether this proposition were true. She would describe her commitment to the truth of this proposition as “believing” as opposed to “knowing.” She could say it requires effort to believe this statement, that its truth is not obvious, and that it is unreasonable to believe. She would think belief in this statement would be unlikely if she had learned about it after age of 25. If someone else argued against believing this proposition were true, then she would feel upset emotionally but not confused or surprised. In fact, she would find the counterarguments valuable, predictable, and logical. Finally, she would find it impossible to say who was right or wrong about the disagreement.

Such a pattern of folk epistemology cannot be described as “evaluativist” and isn’t accurately described by other previous theories. Moreover, the “multiplist” or “absolutist” labels do not fit well either. Participants didn’t think of their religious and political beliefs as objectively true nor exactly as opinions. The findings, taken together, paint a picture of religious and political folk epistemology that challenges previously accepted definitions of truth, knowledge, or belief. These results suggest that commitment to the truth value of a proposition in the religious and political domains does not depend on academic/normative epistemology nor on

standard folk epistemology. It may not even depend exclusively on the content of the proposition.

The findings of the current research suggest that people are less certain that political and religious statements are “true” in the sense that they represent or describe reality. If this is the case, then political and religious beliefs are the most striking cases of domain specificity in folk epistemology ever studied.

#### **9.4 Caveats and Directions for Future Research**

Participants appeared to interpret some questions, or components of questions, in unintended ways. As a consequence, a few of the results are unclear or show no difference between domains. Taken as a whole, however, the body of findings represents a consistent convergence. Nonetheless, these presumably misinterpreted questions could be improved. For instance, participants’ understanding of falsification and correspondence theory could have been better established as part of investigating laypeople’s intuitions regarding these concepts.

Participants identified political beliefs as falsifiable more frequently than they did factual beliefs. It is impossible to know exactly why this result was found but the explanation that participants could not imagine falsifying factual statements like “Maine is north of Florida,” seems likely. Similarly, participants responded that correspondence theory was more the basis for political truth than it was for factual truth. The possible explanation raised for this result was that participants focused on the terminology in the question which asked about “events in the world,” and may have sounded too political.

If these interpretations are correct, then they would constitute a misunderstanding of falsification and correspondence theory by participants. But it is worth noting that even if these

concepts were misunderstood, something can be learned from the results. If applying falsification to everyday factual knowledge sounds simply impossible, and if the idea of statements corresponding to states of the world is confusing to laypeople, then it could be the case that these principles are not major components of folk epistemology. This conclusion cannot be made from the current results, but the possibility that laypeople rarely, if ever, think about falsification or correspondence could be better investigated in future research.

It is possible that asking laypeople to imagine listening to counterarguments against their religious and political beliefs failed to evoke the intended emotional response. For some of the questions regarding reactions to counterarguments, the predictions were unconfirmed. In future research, an alternative manipulation that evoked more emotion could be explored to better test the hypotheses about reactions to challenges to one's beliefs in different domains.

The current research reveals a lot about what political and religious beliefs are not – they are not considered to be certainly true factual knowledge that describes reality. But this then raises the question as to what they are. What is their function? How are they acquired and maintained? Given that they don't exclusively track reality, to what extent does the content of religious and political propositions motivate behavior (e.g., if one "believes" that he will go to heaven then is he willing to take suicidal risks)? It remains to be determined whether the characteristics of the evaluativist stage are absent in the religious and political domains or if they are present but fail to determine beliefs due to other influences. In other words, do believers have access to a critical analysis of their religious and political beliefs, including potentially damning counterarguments, but nevertheless maintain these beliefs because of other motivations? These are questions that now remain for future research. A fuller understanding of religious and

political beliefs may contribute to advances in conflict resolution and to more successful approaches to persuasion. Finally, this understanding can serve as a window into our social nature, illuminating the bonding and group affiliation signaling that these beliefs are likely to facilitate.

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**Appendix 1: List of Statements Used in Study 1**

Statement Number	Intended Domain	Statement	Categorized as Intended by	Opposite Statement	Categorized as Intended by
1	Political	A powerful military is necessary to protect American interests	88%	A powerful military is not necessary to protect American interests	87%
2	Political	Affirmative action leads to unqualified individuals holding important jobs	81%	Affirmative action does not lead to unqualified individuals holding important jobs	69%
3	Political	All Israel wants is to live in peace and Palestine is preventing that from happening.	80%	All Palestine wants is to live in peace and Israel is preventing that from happening.	77%
4	Political	Allowing airport security to profile passengers maximizes safety.	55%	Allowing airport security to profile passengers does not maximize safety.	51%
5	Political	Allowing the NSA to monitor cell phone conversations helps fight terrorism	72%	Allowing the NSA to monitor cell phone conversations does not help fight terrorism	81%
6	Political	Global warming is caused by human pollution	36%	Global warming is not caused by human pollution	39%
7	Political	Green energy (like wind and solar power) is a realistic alternative	35%	Green energy (like wind and solar power) is not a realistic alternative.	41%
8	Political	Heavily taxing large corporations causes the overall economy to suffer	88%	Heavily taxing large corporations does not cause the overall economy to suffer	82%
9	Political	Labor unions are essential for protecting workers' rights	70%	Labor unions are not essential for protecting workers' rights	75%
10	Political	Legalizing marijuana is overall more costly to society	78%	Legalizing marijuana is overall less costly to society	70%
11	Political	Maintaining a high prison population is an effective way of deterring crime	69%	Maintaining a high prison population is not an effective way of deterring crime.	56%
12	Political	Minimum wage is enough to support an individual	63%	Minimum wage is too low to support an individual	49%

13	Political	Most people on welfare are abusing the system rather than looking for work	70%	Most people on welfare are looking for work rather than abusing the system	61%
14	Political	Offering a path to citizenship to illegal immigrants will cause more people to illegally enter the USA	89%	Offering a path to citizenship to illegal immigrants will not cause more people to illegally enter the USA	85%
15	Political	Police in the USA often use lethal force against unarmed black males because of racism	59%	Police in the USA rarely use lethal force against unarmed black males because of racism	67%
16	Political	Providing condoms in public schools is an effective way to reduce STDs and pregnancy	28%	Providing condoms in public schools is not an effective way to reduce STDs and pregnancy	47%
17	Political	Public funding for stem cell research will lead to extremely valuable medical knowledge	52%	Public funding for stem cell research will not lead to extremely valuable medical knowledge	53%
18	Political	Regulations on businesses are necessary to prevent mass extinction of species in the wild	55%	Regulations on businesses are not necessary to prevent mass extinction of species in the wild	70%
19	Political	School vouchers incentivize poorly performing public schools to improve	71%	School vouchers do not incentivize poorly performing public schools to improve	63%
20	Political	Securing the Mexican border will strengthen the American job market	85%	Securing the Mexican border will not strengthen the American job market	86%
21	Political	Spending more tax dollars on the worst performing public schools is a waste	84%	Spending more tax dollars on the worst performing public schools is not a waste	83%
22	Political	The death penalty deters crime	70%	The death penalty does not deter crime	66%
23	Political	The military is weaker if it allows open homosexuality.	75%	The military is not weaker if it allows open homosexuality	72%
24	Political	The population of a country, on average, receives inferior healthcare when the	86%	The population of a country, on average, receives superior healthcare when the	73%

		healthcare system is run by the government.		healthcare system is run by the government.	
25	Political	The right to own guns makes society less safe	69%	The right to own guns makes society safer	81%
26	Political	The war on drugs is a failure	61%	The war on drugs is not a failure	82%
27	Political	Torturing suspected terrorists helps keep the country safe	82%	Torturing suspected terrorists does not help keep the country safe	68%
28	Political	Universities nationwide have a lax response to sexual assault on their campuses.	33%	Universities nationwide do not have a lax response to sexual assault on their campuses.	45%
29	Political	War against Iran is probably necessary to protect national security	90%	War against Iran is probably unnecessary to protect national security	92%
30	Political	Women are paid less than men due to sexism	49%	Women are not paid less than men due to sexism	52%
31	Factual	A square has four right angles	98%	A square does not have four right angles	63%
32	Factual	Airplanes are safe to operate underwater	57%	Airplanes are unsafe to operate underwater	91%
33	Factual	Alcohol consumption impairs driving ability in most people	92%	Alcohol consumption improves driving ability in most people.	64%
34	Factual	Barak Obama's birthday is August 2nd	78%	Barak Obama's birthday is not August 2nd	74%
35	Factual	Birds can fly	100%	Birds can't fly	56%
36	Factual	Bucharest is the capital of Romania	94%	Bucharest is not the capital of Romania	79%
37	Factual	Cellular phones cause HIV	49%	Cellular phones do not cause HIV	90%
38	Factual	Coca-Cola is a brand of soda	98%	Coca-Cola is not a brand of soda	64%
39	Factual	Corn grows well on the moon	56%	Corn does not grow well on the moon	89%
40	Factual	Dinosaurs live today in the Florida swamps	54%	Dinosaurs do not live today in the Florida swamps	93%
41	Factual	Earth's atmosphere is mostly oxygen	85%	Earth's atmosphere is not mostly oxygen	91%
42	Factual	George Clooney is a man	96%	George Clooney is a woman	53%
43	Factual	germs are very small	95%	germs are very large	59%
44	Factual	Gold is heavier than silver	77%	Gold is lighter than silver	72%

45	Factual	Limes are an excellent source of vitamin C	87%	Limes are a poor source of vitamin C	76%
46	Factual	Maine is north of Florida	92%	Maine is south of Florida	67%
47	Factual	Most crimes are committed by people over 80 years old	43%	Most crimes are committed by people under 80 years old	73%
48	Factual	Nigeria has a smaller population than Japan	82%	Nigeria has a larger population than Japan	87%
49	Factual	On average, the north pole is colder than the equator	94%	On average, the north pole is warmer than the equator	67%
50	Factual	Regular exercise usually helps people lose weight	90%	Regular exercise rarely helps people lose weight	67%
51	Factual	Tables are often made of wood.	90%	Tables are rarely made of wood.	58%
52	Factual	The 10 tallest buildings in the world are made entirely of tissue paper	56%	The 10 tallest buildings in the world are not made entirely of tissue paper	88%
53	Factual	The first postage stamp was issued in 1748	85%	The first postage stamp was not issued in 1748	76%
54	Factual	The invention of the internet made sending and receiving information easier	88%	The invention of the internet made sending and receiving information more difficult	55%
55	Factual	The strength of gravity changes according to which day of the week it is	74%	The strength of gravity does not change according to which day of the week it is	91%
56	Factual	Tom Cruise exists	93%	Tom Cruise does not exist	54%
57	Factual	Trees have brains	62%	Trees do not have brains	85%
58	Factual	Tylenol relieves fever and headache	98%	Tylenol does not relieve fever and headache	66%
59	Factual	Ultraviolet light is visible to humans	69%	Ultraviolet light is not visible to humans	91%
60	Factual	US dollars are the official currency of every country in the world	49%	US dollars are not the official currency of every country in the world	68%
61	Religious	After death, there is nothing. You simply die and that's it	71%	After death, there is something. You don't simply die and that's it	84%
62	Religious	After people die their soul goes to heaven or hell	95%	After people die nothing else happens.	76%
63	Religious	Angels exist	91%	Angels do not exist	81%

64	Religious	Angels visit people in dreams	89%	Angels do not visit people in dreams	78%
65	Religious	God can be in multiple locations at the same time.	96%	God cannot be in multiple locations at the same time.	86%
66	Religious	God can hear people's thoughts	96%	God cannot hear people's thoughts	90%
67	Religious	God exists	93%	God did not write the 10 commandments on stones for Moses	89%
68	Religious	God wrote the 10 commandments on stones for Moses	93%	God does not exist	81%
69	Religious	Jesus' mother, Mary, was a virgin when she gave birth to Jesus	96%	Jesus did not rise from the dead	86%
70	Religious	Jesus rose from the dead	99%	Jesus did not walk on water without sinking	90%
71	Religious	Jesus walked on water without sinking	94%	Jesus' mother, Mary, was not a virgin when she gave birth to Jesus	86%
72	Religious	Jesus was more just a person and had supernatural powers	93%	Jesus was just a person with no supernatural powers	84%
73	Religious	Noah put all animal species onto an ark to save them from a flood	89%	Noah did not put all animal species onto an ark to save them from a flood	84%
74	Religious	Prayer can alter what happens in the future	96%	Prayer has no effect on the future	89%
75	Religious	Satan can cause evil events to occur by using supernatural powers	92%	Satan cannot cause evil events to occur by using supernatural powers	91%
76	Religious	Satan is real	95%	Satan was made up to scare people	77%
77	Religious	Sometimes miracles cause people to recover from illness	86%	Miracles never cause people to recover from illness	76%
78	Religious	The bible is perfect and doesn't have contradictions and errors	88%	The bible is far from perfect and full of contradictions and errors	85%
79	Religious	The first humans were created in the garden of Eden	91%	The first humans were not created in the garden of Eden	67%
80	Religious	There is a preexisting plan for each individual's life.	88%	There is no preexisting plan for each individual's life	71%

81	Religious	There will be a second coming of Jesus Christ.	97%	There will never be a second coming of Jesus Christ.	86%
82	Religious	When people consume bread and wine at communion, it turns into flesh and blood inside them	77%	When people consume bread and wine at communion, it does not turn into flesh and blood inside them	64%
83	Other	Frank Sinatra is better than Lady Gaga	66%	No opposite presented	
84	Other	Secrets are more morally correct than lies	58%	No opposite presented	
85	Other	The ethical thing to do is make ceilings lower	64%	No opposite presented	
86	Other	Shorts look better than pants.	71%	No opposite presented	
87	Other	The sewing machine is a more impressive invention than the printing press	63%	No opposite presented	
88	Other	Einstein was smarter than Isaac Newton	55%	No opposite presented	
89	Other	72 is a more comfortable temperature than 71	60%	No opposite presented	
90	Other	Losing one big toe would be worse than losing both middle fingers	63%	No opposite presented	
91	Other	It's ok to be a hypocrite	65%	No opposite presented	
92	Other	A hot dog is not a sandwich	31%	No opposite presented	
93	Other	Chocolate is better than vanilla	70%	No opposite presented	

## **Appendix 2: List of statements used in Study 2.**

Domain	Statement
PS1	War against Iran is probably unnecessary to protect national security. (R)
PS2	Offering a path to citizenship to illegal immigrants will cause more people to illegally enter the USA.
PS3	A powerful military is necessary to protect American interests.
PS4	Securing the Mexican border will not strengthen the American job market. (R)
PS5	The population of a country, on average, receives inferior healthcare when the healthcare system is run by the government.
PS6	Spending more tax dollars on the worst performing public schools is a waste.
PS7	The war on drugs is not a failure.
PS8	Torturing suspected terrorists helps keep the country safe.
PS9	The right to own guns makes society safer.
PS10	Affirmative action leads to unqualified individuals holding important jobs.
RS1	Jesus' mother, Mary, was a virgin when she gave birth to Jesus.
RS2	Prayer can alter what happens in the future.
RS3	After people die their soul goes to heaven or hell.
RS4	Satan is real.
RS5	Jesus walked on water without sinking.
RS6	God exists.
RS7	The first humans were created in the Garden of Eden.
RS8	Noah put all animal species onto an ark to save them from a flood.
RS9	Jesus did not rise from the dead. (R)
FS1	Tom Cruise exists.
FS2	Dinosaurs do not live today in the Florida swamps.
FS3	Bucharest is the capital of Romania.
FS4	Earth's atmosphere is not mostly oxygen.
FS5	Ultraviolet light is not visible to humans.
FS6	Nigeria has a larger population than Japan.
FS7	The first postage stamp was issued in 1748.
FS8	Barak Obama's birthday is August 2nd.
FS9	Gold is heavier than silver.
FS10	Cellular phones do not cause HIV.

Note. P, R, and F represent Political, Religious, and Factual. There was an error with the 10<sup>th</sup> religious statement so it is not shown in Appendix 2, and questions about that statement were excluded from the analyses.



### **Appendix 3: List of Statements Used in Studies 3-7**

Domain	Statement
Political	The military is weaker if it allows open homosexuality.
Political	Most people on welfare are abusing the system rather than looking for work.
Political	A powerful military is necessary to protect American interests.
Political	Affirmative action leads to unqualified individuals holding important jobs.
Political	The population of a country, on average, receives inferior healthcare when the healthcare system is run by the government.
Political	Labor unions are essential for protecting workers' rights.
Political	Securing the Mexican border will strengthen the American job market.
Political	All Palestine wants is to live in peace and Israel is preventing that from happening
Political	Torturing suspected terrorists does not help keep the country safe.
Political	The right to own guns makes society safer.
Religious	When people consume bread and wine at communion, it turns into flesh and blood inside them.
Religious	Jesus' mother, Mary, was a virgin when she gave birth to Jesus.
Religious	The first humans were created in the Garden of Eden.
Religious	The Bible is far from perfect and full of contradictions and errors.
Religious	After someone dies their soul goes to heaven or hell.
Religious	Satan is real.
Religious	Jesus walked on water without sinking.
Religious	God exists.
Religious	Noah put all animal species onto an ark to save them from a flood.
Religious	Jesus did not rise from the dead.
Factual	Cellular phones do not cause HIV.
Factual	Tom Cruise exists.
Factual	Coca-Cola is a brand of soda.
Factual	Maine is north of Florida.
Factual	Airplanes are unsafe to operate underwater.
Factual	Ultraviolet light is visible to humans.
Factual	Germs are very small.
Factual	Limes are a poor source of vitamin C.

Factual Barack Obama's birthday is August 2nd.

Factual Gold is heavier than silver.

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## **Appendix 4: New Indices of Religious Orientation (NIRO)**

Participants respond on a Likert scale from 0-4 (agree strongly, agree, not certain, disagree, and disagree strongly) for each of the 27 items. There are no reverse-scored items. The scale provides three scores: extrinsic orientation, intrinsic orientation, and quest, which are each the sum of the 9 responses in their respective sections.

New Indices of Religious Orientation (NIRO)

### **Extrinsic orientation**

Compartmentalization

- 1) While I believe in my religion, there are more important things in my life.
- 2) While I am a religious person, I do not let religion influence my daily life.
- 3) Occasionally, I compromise my religious beliefs to protect my social and economic well-being.

Social support

- 4) One reason for me going to church is that it helps to establish me in the community.
- 5) A key reason for my interest in church is that it is a pleasant social activity.
- 6) I go to church because it helps me to feel at home in my neighborhood.

Personal support

- 7) One reason for me praying is that it helps me to gain relief and protection.
- 8) What prayer offers me most is comfort when sorrow or misfortune strike.
- 9) I pray chiefly because it makes me feel better.

### **Intrinsic orientation**

Integration

- 10) My religious beliefs really shape my whole approach to life.
- 11) I try hard to carry my religion over into all my other dealings in life.
- 12) My religious beliefs really shape the way I treat other people.
- 13) Public religion I allow almost nothing to prevent me from going to church on Sundays.
- 14) I go to church because it helps me to feel close to God.
- 15) The church is most important to me as a place to share fellowship with other Christians.

#### Personal religion

- 16) I pray at home because it helps me to be aware of God's presence.
- 17) I often read books about prayer and the spiritual life.
- 18) I pray chiefly because it deepens my relationship with God.

#### **Quest orientation**

##### Existentialism

- 19) I was driven to ask religious questions by a growing awareness of the tensions in my world.
- 20) My life experiences have led me to rethink my religious beliefs.
- 21) Religion only became very important for me when I began to ask questions about the meaning of my life.

##### Self-criticism

- 22) I value my religious doubts and uncertainties.
- 23) For me, doubting is an important part of what it means to be religious.
- 24) Questions are more important to my religious faith than are answers.

##### Openness to change

- 25) As I grow and change, I expect my religion to grow and change as well.

26) I am constantly questioning my religious beliefs.

27) There are many religious issues on which my views are still changing.

## **Appendix 5: Right Wing Authoritarianism Scale (RWA)**

Participants respond on 9-point Likert scale from very strongly disagree (-4) to very strongly agree (4) for each item. The scale has an equal number of pro- and anti-authoritarian statements. The first two items are not included in the overall score and are considered practice. Statements 3, 5, 7, 10, 12, 14, 16, 17, 19, and 22 are scored by simply adding 5 to the participant's response. For example, a response of -4 would be scored a 1. The remaining statements are reverse-scored (a response of -4 is scored as a 9, for example). The lowest possible score is a 20 and the highest is a 180.

### Right Wing Authoritarianism Scale (RWA)

- 1) The established authorities generally turn out to be right about things, while the radicals and protestors are usually just "loud mouths" showing off their ignorance.
- 2) Women should have to promise to obey their husbands when they get married.
- 3) Our country desperately needs a mighty leader who will do what has to be done to destroy the radical new ways and sinfulness that are ruining us.
- 4) Gays and lesbians are just as healthy and moral as anybody else.
- 5) It is always better to trust the judgment of the proper authorities in government and religion than to listen to the noisy rabble-rousers in our society who are trying to create doubt in people's minds.
- 6) Atheists and others who have rebelled against the established religions are no doubt every bit as good and virtuous as those who attend church regularly.

- 7) The only way our country can get through the crisis ahead is to get back to our traditional values, put some tough leaders in power, and silence the troublemakers spreading bad ideas.
- 8) There is absolutely nothing wrong with nudist camps.
- 9) Our country needs free thinkers who have the courage to defy traditional ways, even if this upsets many people.
- 10) Our country will be destroyed someday if we do not smash the perversions eating away at our moral fiber and traditional beliefs.
- 11) Everyone should have their own lifestyle, religious beliefs, and sexual preferences, even if it makes them different from everyone else.
- 12) The “old-fashioned ways” and the “old-fashioned values” still show the best way to live.
- 13) You have to admire those who challenged the law and the majority’s view by protesting for women’s abortion rights, for animal rights, or to abolish school prayer.
- 14) What our country really needs is a strong, determined leader who will crush evil, and take us back to our true path.
- 15) Some of the best people in our country are those who are challenging our government, criticizing religion, and ignoring the “normal way things are supposed to be done.”
- 16) God’s laws about abortion, pornography and marriage must be strictly followed before it is too late, and those who break them must be strongly punished.
- 17) There are many radical, immoral people in our country today, who are trying to ruin it for their own godless purposes, whom the authorities should put out of action.

- 18) A “woman’s place” should be wherever she wants to be. The days when women are submissive to their husbands and social conventions belong strictly in the past.
- 19) Our country will be great if we honor the ways of our forefathers, do what the authorities tell us to do, and get rid of the “rotten apples” who are ruining everything.
- 20) There is no “one right way” to live life; everybody has to create their own way.
- 21) Homosexuals and feminists should be praised for being brave enough to defy “traditional family values.”
- 22) This country would work a lot better if certain groups of troublemakers would just shut up and accept their group’s traditional place in society.



## **Appendix 6: Demographic Questionnaire**

Please enter your age in years.

Gender:

- Female
- Male
- Prefer not to answer

Which of the following best describes your highest level of education?

- Less than high school graduate
- High school graduate
- Attended some college
- College graduate
- Graduate school
- Prefer not to answer

What was your household income last year before taxes?

- Less than \$25,000
- \$25,000 - 34,999
- \$35,000 - 49,999
- \$50,000 - 74,999
- \$75,000 - 99,999

- \$100,000 or more
- Prefer not to answer

Please indicate your ethnicity:

- Hispanic or Latino
- Not of Hispanic/Latino Origin
- Prefer not to answer

Please indicate your race:

- American Indian/Alaska Native
- Asian
- Black/African American
- Native Hawaiian or Other Pacific Islander
- White
- More than one race
- Other
- Prefer not to answer

Which of the following best represents your religious affiliation?

- Roman Catholic
- Protestant/other non-denominational Christian
- Jewish

- Muslim
- Mormon
- Atheist/realist/humanist
- No affiliation
- Other
- Prefer not to answer

What political party do you most identify with?

- Democrat
- Republican
- Independent
- Constitution Party
- Green Party of the United States
- Libertarian Party
- Other
- Prefer not to answer

Which description best represents your political ideology?

- Progressive/very liberal
- Liberal
- Moderate
- Conservative

- Very conservative
- Libertarian
- Not sure
- Prefer not to answer

Please indicate the geographic region in which you live:

- Northeast (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, New Jersey)
- Midwest (Wisconsin, Michigan, Illinois, Indiana, Ohio, Missouri, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa)
- South (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Mississippi, Alabama, Oklahoma, Texas, Arkansas, Louisiana)
- West (Idaho, Montana, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico, Alaska, Washington, Oregon, California, Hawaii)
- Other \_\_\_\_\_
- Prefer not to answer

Which of the following best represents where you live?

- Large city (100,000 or more residents)
- Small city (less than 100,000 residents)
- Suburbs

- Rural area
- Prefer not to answer

Please enter your MTurk Worker ID in the text box below.

If you have any general comments about this study enter them here. Let us know if you had any difficulty or problems completing the study.