

PERCEPTIONS OF ATHEISTS' ORIGIN STORIES  
AND ANTI-ATHEIST PREJUDICE

by

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## ABSTRACT

While substantial research on anti-atheist prejudice has considered the role of theists' traits and beliefs, there has been little focus on the potential impact of theists' perceptions of atheists' beliefs. Specifically, perhaps perceptions of atheists' reasons for accepting atheism further explains anti-atheist prejudice. In the present experiment, participants reported dislike, distrust and pity for atheists who endorse one of four routes to atheism. The four routes assessed were: 1) Analytical: analytical resistance to religious belief, 2) Apathism: a lack of motivation to believe in deities, 3) Mindblind: a lack of ability to conceive of unobservable deities, and 4) InCREDulous: a lack of exposure to displays of religious devotion. We observed less disliking and distrust, but greater pity, of InCREDulous Atheists compared to each of the other three routes. Further analysis revealed that this difference may be partially explained by theists' perception that InCREDulous Atheists are indifferent rather than opposed to theism. These findings may suggest that merely a perception that atheists are receptive to arguments for religious belief might reduce anti-atheist prejudice.

## LIST OF ABBREVIATIONS AND SYMBOLS

<i>b</i>	In regression and multiple regression analyses, estimated values of raw (unstandardized) regression coefficients
<i>d</i>	Cohen's measure of sample effect size for comparing two sample means
<i>F</i>	Fisher's F ratio
MTurk	Amazon Mechanical Turk: A website through which member can participate in studies in exchange for money
<i>M</i>	Arithmetic mean of the sample or subsample
<i>N</i>	Number of participants or cases in a sample
<i>n</i>	Number of participants or cases in a subsample
OS	Origin Story
<i>p</i>	Probability associated with the occurrence under the null hypothesis of a value as extreme as or more extreme than the observed value
<i>r</i>	Estimate of Pearson product-moment correlation coefficient
$R^2$	Multiple Pearson product-moment correlation squared
$r_p$	Partial correlation of two variables while controlling for a third variable
<i>SD</i>	Standard deviation
<i>SE</i>	Standard error
<i>t</i>	Value expressing the difference between the mean of two subsamples
$\alpha$	Cronbach's index of internal consistency
$\beta$	In regression and multiple regression analyses, estimated values of standardized regression coefficient

$\Delta$	Change in a value between the first and second measurement
$\eta_p^2$	Percentage of variance in variable A explained by variable B while controlling for the effect of variable C

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## INTRODUCTION

Despite the fact that atheists are the fourth most prevalent religious group worldwide (Zuckerman, 2007), for Americans, prejudice against atheists is more severe than even the prejudice against other highly stigmatized groups such as Muslims and gay people (Cook, Cottrell, & Webster, 2015; Johnson, Rowatt, & LaBouff, 2012; Edgell, Gerteis & Hartmann, 2006). Perceptions of atheists are deeply rooted in seeing this group as amoral and even uniquely un-American in their moral values (Edgell, Gerteis & Hartmann, 2006). Egregious moral transgressions such as rape and serial murder are judged to be more representative of atheists than of gay people, ethnic minorities, and members of any major religion (Gervais, 2014). This prejudice also manifests in behaviors towards atheists as atheists are likely to be excluded from activities involving intragroup cooperation (Gervais, Shariff, & Norenzayan, 2011), and parents report they would discourage their children from marrying an atheist (Edgell, Gerteis & Hartmann, 2006). What is it about people's understanding of atheists that leads them to have such negative perceptions and expectations? In the proposed research, I plan to assess if the perceived reasons that people become atheists influences prejudice against them.

Not surprisingly, this marked prejudice has often been considered by researchers to be a significant social issue, and there has been a surge in studies investigating the causes of anti-atheist prejudice. At the most fundamental level, both religiosity and belief in God(s) have been found to be positively associated with prejudice against atheists (Shen, Haggard, Strassburger, & Rowatt, 2013; Shen, Yelderman, Haggard, & Rowatt, 2013; Simpson & Rios, 2017). Substantial research has revealed additional predictors, such as distrust of atheists, cognitive rigidity, and

perceptions of atheists' values (e.g., Gervais, Shariff, & Norenzayan, 2011; Kossowska, Czernatowicz-Kukucska, & Sekerdej, 2017; Simpson & Rios, 2016). With the exception of research on perceptions of atheists' values, little research has investigated how meta-beliefs – beliefs about what atheists believe – are related to prejudice against atheists. The present research will consider how perceptions of atheists' inner narratives about how they came to reject the existence of supernal entities (subsequently referred to as atheist “origin stories”), might be associated with prejudice against atheists.

### **Existing Research on Anti-Atheist Prejudice**

In considering existing research it is important to not only consider unexplored factors that may enhance our understanding of anti-atheist prejudice, but also to consider how the factors that contribute to this prejudice might be mitigated through interventions. In my assessment, there are currently three categories of research on anti-atheist prejudice which have provided the most insight regarding the causes of this prejudice: 1) Perceiver effects – perceiver traits and broad attitudes (not specific to atheists), 2) Perceived moral value differences between theists and atheists, and 3) Perceptions that atheists are untrustworthy.

#### ***Perceiver Effects***

One intuitive factor that may be critical in predicting an individual's attitude towards an outgroup is their attitude toward people in general. One study found that feelings toward the ingroup (other religious [non-religious] people) were associated with feelings toward the outgroup in the range of  $r = .25-.55$  (McDiarmid & Tullett, 2018). In any empirical attempts to predict negative attitudes toward atheists, it may be critical to consider this robust factor<sup>1</sup>.

Some research has found that the association between religiosity and anti-atheist prejudice may be partly explained by cognitive traits that are common for highly religious people

(Kossowska, Czernatowicz-Kukucska, & Sekerdej, 2017; Shen, Haggard, Strassburger, & Rowatt, 2013; Shen, Yelderman, Haggard, & Rowatt, 2013). Specifically, multiple traits associated with cognitive rigidity have been found to be associated with anti-atheist prejudice. For instance, one such study found that 2 of the 3 right-wing authoritarianism (RWA) subscales (aggression & conventionalism) were associated with negative attitudes toward both atheists and gay people (Shen, Haggard, Strassburger, & Rowatt, 2013). Those high in RWA-aggression characteristically believe that the agenda of fringe beliefs groups should be actively put to a stop, while those high in RWA-conventionalism characteristically believe that it is not permissible for people to reject societal norms. These RWA subscales were found to fully mediate the positive relationship between religiosity and negative attitudes towards atheists.

In another study investigating the influence of cognitive styles, it was found that a literal interpretation of religious concepts was predictive of greater prejudice against atheists (Shen, Yelderman, Haggard, & Rowatt, 2013). More literal interpretation of religious concepts has also been considered a measure of cognitive rigidity (though conceptually less generalized). Similar to findings for RWA, the researchers found that a literal understanding of religion, combined with belief in a transcendent God, partially mediated the relationship between religiosity and anti-atheist prejudice.

While traits related to cognitive rigidity appear to be a robust predictor of prejudice it is noteworthy that these factors are unsuitable targets for prejudice intervention as such traits tend to be unmalleable. Furthermore, it may be that cognitive rigidity is only predictive of anti-atheist prejudice when atheists are thought to hold very different beliefs than the perceiver.

### *The Perceived Values of Atheists*

The only belief that is inherent to being an atheist is that God(s) (probably) does not exist. Consequently, the remaining perceptions about what the average atheist thinks are conjecture on the part of the perceiver. Not only are typical perceptions of atheists' views and values inaccurate, some work has found that these perceptions are predictive of prejudice (Simpson & Rios, 2016; Simpson & Rios, 2017; McDiarmid & Tullett, 2018).

In two investigations, Simpson and Rios (2016; 2017) used moral foundations theory (Graham et al., 2013) to evaluate the moral stereotypes that Christians have about atheists. Moral foundations theory postulates that moral values reflect five underlying dimensions: fairness/justice, compassion/caring, ingroup loyalty, respecting authority figures, and purity/decency.

In the first set of studies, Christians rated themselves as more concerned than atheists about each of the five foundations but focused on a lack of compassion and respect for authority when writing negatively valenced essays about atheists (Simpson & Rios, 2016). In the second set of studies, participants were experimentally manipulated to believe that atheists are strongly (vs. minimally) concerned with one of the five moral foundations (Simpson & Rios, 2017). Prejudice against atheists, compared to people in general, was stronger when participants were manipulated to think atheists are not concerned with compassion, but prejudice was not associated with the other four foundations. The authors concluded that the perception that atheists are not concerned with compassion is the strongest morally based predictor of anti-atheist prejudice.

Given that a perceived lack of compassion is associated with anti-atheist prejudice, it seems important to understand where this perception comes from. It is possible that people who

have become atheists for different reasons, for instance, are perceived to have different levels of compassion. In other words, perhaps just one type of atheist (those that became atheists for a given reason) is perceived as uncompassionate, and this type of atheist is seen as prototypical by theists. If so, rectifying perceptions that atheists are homogeneous in their reasons for accepting religious disbelief, may ameliorate prejudice against this group.

### ***Distrust of Atheists***

At present, one of the more prominent theories regarding anti-atheist prejudice posits that generalized prejudice against atheists is mostly driven by distrust of atheists. This supposition makes sense in the framework of a sociofunctional approach to prejudice, which maintains that outgroups are seen as presenting distinct threats that evoke specific negative emotional responses (e.g., African Americans are perceived as a threat to safety and thus evoke fear, while gay people are perceived as a threat to purity and thus evoke disgust; Cottrell & Neuberg, 2005). Gervais, Shariff, and Norenzayan (2011) contend that atheists are perceived as a threat to intragroup cooperation and therefore primarily evoke distrust. Intragroup cooperation is only attractive when the majority of group members will contribute to collective goals rather than just benefiting from group gains without contribution. Yet, it is difficult to detect social loafing. When group members are religious, this provides a heuristic cue that suggests that they believe God can observe social loafing. As such, they should be more likely to avoid such behaviors out of fear of punishment. Atheists are a threat to intragroup cooperation because their lack of belief in God suggests that nothing is stopping them from engaging in social loafing or even sabotaging the group's goals if they stand to profit. In one investigation, distrust was a strong predictor of variance in anti-atheist prejudice (but not anti-gay prejudice). Furthermore, believing that people

behave better when they think they are being monitored by God fully mediated the relationship between belief in God and distrust of atheists (Gervais, Shariff, & Norenzayan; 2011).

Further research has supported this framework. When atheists are perceived to be more prevalent, they are viewed as unlikely candidates to be disposed toward social loafing because a large group frequently engaging in these acts would be exposed (Gervais, 2011).

Consequentially, when atheists are viewed as a prominent group they are perceived to be more trustworthy. Another experiment observed that atheists are perceived as more trustworthy when participants are primed with reminders of secular sources of authority (Gervais & Norenzayan, 2012). The authors argue that this is due to a perception that as long as atheists believe their behavior is being monitored by authorities who could punish them, they are less of a threat to intragroup cooperation.

Overall, this research suggests that atheists are viewed as untrustworthy because, on the surface, it would seem that they would not expect detection or punishment for acting amorally within a group. Implicit in this logic is an assumption about what atheists think. It is perceptions of the degree to which atheists *think* they are being socially monitored that dictates if they are viewed as a threat to intragroup cooperation. Similarly, atheists' stated reasons for not believing in God(s) may also affect perceptions of how likely they are to behave morally. There is reason to think that atheists' origin stories do not influence distrust because atheists, regardless of origin story, do not believe in a supernatural monitor. Alternatively, though perhaps less likely, atheists' origin stories could influence distrust if they illustrate a path to atheism that has nothing to do with a desire to evade consequences for immoral acts.

## **Pity and the Perceived Competency of Atheists**

The stereotype content model, like the socio-functional approach to prejudice, posits that outgroups evoke different emotional responses (Fiske, Cuddy & Glick, 2007; Fiske, Cuddy, Glick, & Xu, 2002; Fiske, Xu, Cuddy, & Glick, 1999). In this case, these responses are thought to depend upon how groups are judged on the dimensions of warmth and competence.

Considering competence independently of warmth, as groups are judged to be less competent they become more likely to be pitied irrespective of warmth. It could be informative to investigate if some atheist origin stories imply that the storyteller is not very competent, which could subsequently evoke pity. I will investigate pity as a negative attitude towards atheists in regard to its relationship with theists' perceptions of atheists' competency, and perceptions of atheists' origin stories.

## **Atheism's Evolutionary Pathways and Origin Stories**

Norenzayan and Gervais (2013) used converging evidence to argue that there are four evolutionary pathways to atheism: 1) Mindblind Atheism, which stems from difficulty conceiving of supernatural beings who have relationships with humans but are not directly observable, 2) Apathism, which stems from a lack of motivation to develop faith in supernatural beings due to existential security, 3) InCREDulous Atheism, which stems from lack of exposure to people willing to make sacrifices for their religious beliefs (credibility enhancing displays, or CREDs), and 4) Analytical Atheism, which stems from analytical thinking that overrides (or blocks) an intuitive belief in supernatural beings. In essence, Path 1 involves a lack of ability to hold religious beliefs; Path 2 involves a lack of motivation to hold religious beliefs; Path 3 involves a lack of modeling of religious beliefs; and Path 4 involves using logic to override an ability, the motivation, and the encouragement to form religious beliefs. It is my expectation that



atheists would say that some of these pathways played a part in their personal journey to atheism and that theists will perceive these pathways, to varying degrees, as routes taken by atheists. Consequently, I plan to reframe these evolutionary pathways as origin stories describing *why* a given atheist arrived at religious disbelief.

## **Overview**

In the current research, I aimed to extend our understanding anti-atheist prejudice by examining a novel predictor: perceptions of typical atheist origin stories. I investigated this question by describing the four origin stories as a rationale for atheism that some atheists endorse. For each group of atheists endorsing one of these origin stories (subsequently referred to as “atheist subtypes”), participant provided ratings of prejudice for specifically that atheist subtype. Using a separate method, I also addressed this question by asking theists to estimate the percentage of atheists that would say that each origin story played a significant role in their atheism. I then tested how these percentage estimates related to three types of prejudice towards atheists: 1) Generalized negative attitudes (e.g., coldness), 2) Distrust, and 3) Pity. Finally, I also investigated the relationship by considering four accounts that may explain for how attitudes toward atheists may vary depending on perceived origin stories. The four accounts propose that perceptions of atheists’ origin stories affect anti-atheist prejudice indirectly through affecting these four perceptions of atheists: 1) Atheists are opposed (vs. indifferent) to religious belief, 2) It would have been difficult (vs. easy) for atheists to have become theists instead, 3) People behave more morally (vs. differently) when they believe their behavior is observed by God(s), and 4) Atheists are generally competent (vs. incompetent) people. While I present specific hypotheses based on these accounts, my primary interest in the present research is broad: are perceptions of atheists’ origin stories predictive of anti-atheist prejudice? I will use these

measures to test a series of hypotheses which can be assessed in terms of fit with the proposed accounts.

### ***Generalized Negative Attitudes***

I propose that perceptions of typical origin stories may be associated with generalized attitudes towards atheists because they provide information about two factors. First, perceived opposition vs. indifference to religion could be related to origin stories if a given atheist's origin story suggest this individual does not only reject God(s) but is also opposed to anyone else accepting God(s). Second, perceptions that it would have been easy vs. difficult for atheists to become theists instead may be associated to with origin stories to the degree that some origin stories may imply that many decision to become atheists are due to uncontrollable circumstances. These factors would seem to suggest different predictions for which origin stories would evoke the least favorable attitudes.

**Opposition to Theism.** Atheists will evoke more favorable attitudes if their typical origin stories suggest indifference to religious belief. Consistent with Norenzayan and Gervais' (2013) characterizations of the evolutionary paths, I expect Mindblind Atheism to be perceived as neither associated with indifference or opposition (but rather not understanding religious belief), Apatheism and InCREDulous Atheism to be associated with indifference toward religious belief, and Analytical Atheism to be associated with opposition to religious belief. It follows that if opposition to religious belief is indeed associated with unfavorable attitudes, I would expect perceptions that Mindblind Atheism is common to be unrelated to generalized negative attitudes; perceptions that Apatheism and InCREDulous Atheism is common to be associated with more favorable attitudes toward atheists; and Analytical Atheism to be associated with less favorable attitudes toward atheists. According to the Opposition to Theism account, for independent ratings

of the four atheist subtypes, I expect Apatheists and InCREDulous Atheists to be viewed to most favorably, Analytical Atheists the least favorably (with Mindblind atheists somewhere between the extremes

While these hypotheses are largely based on intuition, there is some empirical support for these predications. For instance, it has been found that atheists represent an existential threat to theists because of a belief that atheists will try to convince them that they are wrong about the existence of an afterlife (Cook, Cohen, & Solomon, 2015). Thus, Analytical Atheists may be viewed as not only holding attitudes opposing religious belief but to actively oppose religious people's beliefs through their behaviors. It is also informative to know that in the domain of politics, Democrats and Republicans see their rivals as so opposed to their point of view that they believe their rivals are motivated to undermine the issues that are most dear to them, and are consequentially prejudiced against them (Chambers & Melnyk, 2006). This suggests that other groups that are seen as opposed to core ingroup beliefs (e.g., religious belief) are perceived to possess sinister motives and are especially despised for this reason.

**Barriers to Theism.** Atheists will be viewed more favorably if their perceived origin stories suggest that they had limited control over their path to atheism. I expect Mindblind Atheism and InCREDulous Atheism to be perceived as less controllable relative to Apatheism and Analytical Atheism. If this relationship is observed, I would expect Mindblind and InCREDulous atheism to be associated with more favorable attitudes toward atheists and Analytical Atheism to be associated with less favorable towards atheists (with Apatheism between the extremes).

This prediction is also based largely in intuition but anti-gay prejudice may be informative. Research has found that people are less prejudiced against gay people when they

believe that being gay is genetic rather than under personal control (e.g., Haider-Markel & Joslyn, 2008; Jayarantne et al. 2006).

### ***Distrust of Atheists and Supernatural Surveillance***

While distrust of atheists is predictive of generalized negative attitudes toward atheists, it is not the only predictor. Therefore, it is possible that perceptions of origin stories might influence generalized negative attitudes without influencing distrust. It seems likely that atheists will express disbelief in supernatural surveillance, regardless of origin story. As distrust is robustly linked with a perception that people behave better when they think they are under supernatural surveillance (Gervais & Norenzayan, 2012; Gervais, Shariff, & Norenzayan, 2011), I anticipate that prevalence estimates for atheist origin stories will have no influence on distrust. Relatedly I anticipate that trust will not significantly vary between atheist subtypes.

Alternatively, if any atheist origin stories are related to distrust, this would suggest that distrust of atheists may be a more complex phenomenon. There is currently no empirical basis, to my knowledge, that would suggest a specific mechanism for how origin stories might influence distrust. Nonetheless, it does seem intuitively plausible that some reasons for arriving at an atheist identity would suggest that the individual is more similar or less similar to the perceiver which in turn could influence prevalence estimates.

### ***Pity Towards Atheists and the Stereotype Content Model***

As religious belief is often a source of comfort and inspiration for believers, it stands to reason that atheists might be pitied by theists. It may be informative to try to identify origin stories that predict the perception that atheists are low in competence and therefore pitiable. The stereotype content model predicts that if groups are seen as low in competence, they are more likely to be pitied (Fiske, Cuddy, Glick, & Xu, 2002). I anticipate that when Mindblind Atheism

is viewed as a typical atheist origin story, atheists will be perceived to have low competence because Mindblind Atheism implies a lack of *ability* to imagine intangible forces and, is therefore, also expected to evoke pity. I anticipate that inCREdulous Atheism will have no relationship with competence or pity because this origin story does not have clear implications for the ability of the storyteller. In contrast, I anticipate that Apatheism suggests that these atheists are leading successful lives and therefore will be perceived as high in competence and therefore will not be pitied. Last, I anticipate that Analytical Atheism will suggest that these atheists are highly motivated, and perhaps logical or intelligent. As this implies ability, I expect perceptions that this is a typical origin story to be associated with perceptions of higher competency and less pity. All four theoretical claims will be compared to the study results and conclusions will be drawn regarding how well these claims conform or diverge from observed outcomes.

## METHODS

### **Design**

This study utilized both correlational and experimental design elements to assess three different types of attitudes towards atheists 1) generalized negative attitudes, 2) distrust, and 3) pity. Using a correlational design, I tested whether these attitudes were predicted by theists' prevalence estimates for each of the four origin stories (Mindblind Atheism vs. Apatheism vs. InCREDulous Atheism vs. Analytical Atheism), controlling for the same attitudes toward other theists. Origin Story Prevalence Estimates (OS Prevalence Estimates) measure theists' estimates of how frequent these origin stories were among atheists. For the experimental design – manipulating Atheist Subtype within-subjects – participants read about four different types of atheists, one representing each of the origin stories, and rated the same three attitudes above (generalized negative attitudes, distrust, and pity) towards each one.

### **Participants**

Because prejudice towards atheists in the “bible-belt” may not be representative of the rest of the country, I recruited theist participants from both MTurk and from the University of Alabama subject pool. Having both samples was intended to clarify conclusions regarding the generalizability of findings. As anticipated, there were demographic differences between our samples which may be associated with prejudice against atheists. Particularly noteworthy were differences in mean age (MTurk: 36.20 vs, University: 19.82) and mean religiosity (MTurk: 1.32 vs, University: 2.46; *-4 = strongly disagree, 4 = strongly agree with*, “I consider myself a

religious person”). While speculative, these samples are also likely to vary in their exposure to atheists given the wide range of locations in the MTurk sample compared to “bible-belt” localization for the university sample. Past research has found that greater contact with atheists is predictive of less prejudice against atheists (Labouff & Ledoux, 2016).

As there is little empirical basis for anticipating effect sizes, the target sample size was based on an assessment that an effect which uniquely explains 3% of the variance is large enough to be of interest. Thus, I aimed to recruit 376 subjects because I required 342 theist subjects (half from each sample) to achieve 90% power for detecting  $R_p^2 \geq .03$  for OS prevalence estimates regression coefficients, and I will aim for 34 more to compensate for excluded subjects. I also aimed to recruit a sample of at least 100 atheists (for a pilot study) who completed a different set of measures from theists.

Six-hundred and fifteen participants initially agreed to participate in the study but 33 participants were prevented from completing the study due to failing our instruction manipulation check twice (Oppenheimer, Meyvis, & Davidenko, 2009; see procedure). An additional 76 participants dropped out of the study before completing any measures. Participants were excluded from analyses if they participated multiple times ( $n = 6$ ; not excluding their first attempt) or completed the study in less than two minutes, for theists, or, in less than one minute and forty-one seconds, for atheists ( $n = 10$ ). Minimum completion times were based on another pilot test of 10 peers (split evenly between the theist and atheist procedures; subsequently discussed) with an a priori criterion to exclude participants that completed the study in less than 25% of the pilot test mean time for their group (theist vs. atheist). After exclusions, I was left with a final sample of 194 university theists, 191 MTurk theists, and 105 MTurk atheists.

## Procedure

Participants began the study with an instructional manipulation check designed to encourage attentive responses to subsequent questions (Oppenheimer et al., 2009). Participants also engaged in a brief training tutorial providing definitions of agnosticism, atheism, and theism and then complete a definition comprehension check. The University of Alabama sample was prescreened for belief in God(s) and participants were only invited to participate if they identified as theists. During the study, participants again categorized themselves as either theists or atheists according to provided definitions. Theist and atheist procedures diverged from this point (see Pilot Study Procedure for atheists' procedure).

Theist participants completed two counterbalanced question blocks. One block assessed OS Prevalence Estimates along with prejudice toward atheists and theists in general. The second block assessed prejudice toward each atheist subtype (one for each origin story). As attitude ratings for atheist type could potentially influence subsequent attitude ratings for atheists in general (or vice versa), block order was counterbalanced. Within the first block, the order of OS Prevalence Estimates and prejudice measures was also randomized.

Generalized negative attitudes towards atheists, and theists, were measured with two items scored on 0-100 scales. The first measured feelings toward atheists [theists] ( $0 = \textit{very cold}$ ,  $100 = \textit{very warm}$ ), and the second measured how well participants like atheists [theists] ( $0 = \textit{strongly dislike}$ ,  $100 = \textit{strongly like}$ ). Distrust of atheists, and theists, was also measured with two items scored on 0-100 scales. For the first item, participants reported on how trustworthy they found atheists [theists] ( $0 = \textit{very untrustworthy}$ ,  $100 = \textit{very trustworthy}$ ), and for the second item participants reported on whether they think atheists [theists] can be depended on to “do the right thing” ( $0 = \textit{not at all}$ ,  $100 = \textit{absolutely}$ ). Finally, pity of atheists, and theists, was also



measured with two items scored on 0-100 scales. For the first item, participants reported the degree to which they pitied atheists [theists] ( $0 = \text{complete lack of pity}$ ,  $100 = \text{strongly pity}$ ), and for the second item participants reported the degree to which they felt sorry for atheists [theists] ( $0 = \text{not at all}$ ,  $100 = \text{absolutely}$ ). Scores for the three item pairs showed good to excellent internal consistency for ratings of both atheists (Cronbach's  $\alpha$ : Generalized negative attitudes = .90, Distrust = .92, and Pity = .87), and theists (Cronbach's  $\alpha$ : Generalized negative attitudes = .88, Distrust = .85, and Pity = .79) for generalized negative attitudes, distrust, and pity respectively). Item to scale correlations suggest the items are somewhat redundant (for all correlations  $r > .74$ ); With the exception of pity toward theists ( $r = .65$ ). While adding second items failed to effectively broaden our measurements of the constructs, high internal consistency indicated it was appropriate for us to average item scores within each measure. The order of presentation for all 12 items was randomized.

For OS Prevalence Estimates, participants began by reading a prompt explaining that, like many theists, many atheists may have narratives about how they became<sup>2</sup> atheists. Participants were then asked to make estimates, on a 0-100% scale, regarding the percentage of *atheists who would say* that various narratives played a *significant* role in how they became atheists ( $0\% = \text{none would say this played a significant role}$ ,  $50 = \text{half would say this played a significant role}$ ,  $100 = \text{all would say this played a significant role}$ ). I included instructions to clarify that atheists may endorse multiple narratives (i.e., frequency ratings for the four types of origin stories do not have to total 100). The four narratives were derived from Norenzyan and Gervais' (2012) proposed evolutionary pathways to disbelief, but in a simplified form to enhance comprehension. The narratives were described as follows and presented in a randomized order:

- 1) Mindblind Atheism: “They became an atheist because they found it difficult to imagine a God that we can’t observe.”
- 2) Apatheism: “They became an atheist because they felt that they didn’t need to believe in a God in order for their lives to be happy and meaningful.”
- 3) InCREdulous Atheism: “They became an atheist because they were not exposed to many people in their community that engaged in religious behaviors (such as going to religious services).”
- 4) Analytical Atheism: “They became an atheist because their logical side caused them to doubt the existence of a God.”

Because by way of analogy for participants to better contextualize these narratives, I compared atheists’ origin stories to religious conversion stories, we assessed if participants were confused by this comparison. Specifically, we asked participants if it made sense to them that atheist might have narratives for how they adopted their belief system including mention that we compared these to conversation stories. We measured comprehension on a 5-point scale (*1 = strongly disagree* [that origin narratives make sense for atheists], *5 = strongly agree*).

For the second block, theists answered the 12 attitudes questions previously described, but with regard to atheists who were said to endorse each of the four origin stories (i.e., prejudice toward each atheist subtype). Participants were asked “what do you think of atheists who say this?” followed by one of the four origin stories with wording modified for the question context. They provided attitude ratings for atheists endorsing all four origin stories. This design allowed me to investigate whether different origin stories might cause different degrees of anti-atheist prejudice.

After completing both blocks, theists responded to four questions assessing potential mediators of anti-atheist prejudice. The first question assessed perceptions of atheists' opposition to theism. Participants were asked, "To what degree is the average atheist opposed to other people believing in God or gods?" and provide responses on a 5-point Likert scale (*1 = completely indifferent, 3 = somewhat opposed, 5 = completely opposed*). The second question assessed perceptions regarding the severity of atheists' barriers to theism. Participants were asked, "How challenging would it have been for the average atheist to overcome their reasons for becoming atheists?" and provide responses on a 5-point Likert scale (*1 = could have been easily overcome, 3 = moderately challenging to overcome, 5 = easily could have been overcome*). The third question assessed perceptions of atheists' competence and will be measured by asking participants, "How competent do you think atheists are as a group?" with responses provided on a 5-point Likert scale (*1 = not at all, 5 = extremely*). The fourth question assessed beliefs that morality is encouraged by perceptions of supernatural surveillance. Participants will be asked to agree or disagree with the statement, "People behave better when they feel that God is monitoring their behavior," on a 7-point Likert scale (*-3 = strongly disagree, 0 = neither agree nor disagree, 3 = strongly agree*). While these variables are not mutually exclusive, they are aimed to assess four accounts (Opposition to Theism, Barriers to Theism, Competence, and Supernatural Surveillance) of why perceptions of atheists' origin stories may affect anti-atheist prejudice. Last, participants provided demographic information including: gender, race, age, education, religiosity, political party, and political ideology.

### **Pilot Study**

I recruited an MTurk sample of at least 105 atheists (after exclusions). The atheist sample was only used to compare theists' prevalence *estimates* of atheist origin stories to the percentage

of atheists that *actually* identify with these origin stories. A power analysis was not necessary for the atheist sample because I did not conduct inferential analyses with their results but rather descriptively compared estimates of atheist origin stories to their actual origin stories. Atheist participants engaged in a much shorter procedure. These participants indicated if each of the four origin stories played a significant role in them becoming atheists (responding with either “yes” or “no”) and provided demographic information. These measures provided a descriptive estimate with which to compare theists’ perceptions of atheists.

## RESULTS

My primary purpose was to investigate whether different atheist origin stories elicit different attitudes towards atheists. It is possible that some reasons for becoming an atheist are seen as more acceptable than others or are associated with other traits that mitigate prejudicial attitudes. Alternatively, it may be that atheists are judged equally regardless of how they came to be religious disbelievers. I utilized both correlational and experimental approaches to consider these possibilities for each of the three prejudice measures: generalized attitudes, trust, and pity.

### **Pilot Study Results**

Comparison of the origin stories actually endorsed by atheists against theists' OS prevalence estimates show notable inaccuracy. Theists underestimated how many atheists would endorse Analytical Atheism (68.7% vs. 89.5%) and Apatheism (59.0% vs. 70.5%). Conversely, theists overestimated how many Atheists would endorse InCREDulous Atheism (48.3% vs. 21.9%) and Mindblind Atheism (68.6% vs. 51.4%).

### **Generalized Negative Attitudes**

Generalized attitudes toward atheists were measured with a two-item scale measuring warmth and liking. I investigated competing hypotheses about how origin stories might be associated with these attitudes. If negative attitudes are driven by perceptions of atheists' opposition to theism, I would expect Analytical Atheism to be predictive of less favorable attitudes compared to Apatheism and InCREDulous Atheism (with Mindblind Atheism between the extremes). Alternatively, if negative attitudes are driven by perceptions of atheists' barriers to

theism, I would expect Analytical Atheism to be predictive of less favorable attitudes compared to Apatheism and *Mindblind* Atheism (with Apatheism between the extremes).

### ***Experimental Analyses***

I conducted a 4 (Atheist Subtype: Mindblind vs. Apatheism vs. InCREDulous vs. Analytical) x 2 (Sample: University vs. MTurk) mixed ANOVA to assess effects on generalized attitudes toward atheists. The aim of this analysis was to infer if different rationales for accepting religious disbelief (the only explicit difference between the subtypes) influence generalized negative attitudes toward atheists. All within subject analyses used a Greenhouse-Geisser adjustment for mild non-sphericity. As anticipated, there was a significant main effect of Atheist Subtype (Mindblind vs. Apatheism vs. InCREDulous vs. Analytical),  $F(2.7, 1007.7) = 38.24, p < .001, \eta_p^2 = .093$ . There was a significant main effect for Sample,  $F(1, 370) = 9.10, p = .003, \eta_p^2 = .024$ , but not a significant interaction,  $F(2.7, 1007.7) = 2.67, p < .001, \eta_p^2 = .007$ .

In support of the Opposition to Theism account, a planned contrast revealed that Apatheists and InCREDulous Atheists (combined  $M = 55.38, SD = 22.53$ ), were evaluated significantly more favorably than Analytical Atheists ( $M = 52.66, SD = 24.32$ ),  $t(374) = 3.72, p < .001, d = .19$ . In support of the Barriers to Theism account, a second planned contrast revealed that *Mindblind* Atheists and InCREDulous Atheists (combined  $M = 56.46, SD = 21.55$ ), were evaluated significantly more favorably than Analytical Atheists ( $M = 52.66, SD = 24.32$ ),  $t(374) = 5.48, p < .001, d = .29$ . Finally, supporting the Barriers to Theism account, but contradicting the Opposition to Theism account, a third planned contrast revealed that *Mindblind* Atheists ( $M = 53.53, SD = 23.39$ ), were evaluated significantly more favorably than Apatheists ( $M = 51.29, SD = 26.41$ ),  $t(374) = 2.68, p = .008, d = .14$ .

While this pattern is most consistent with the Barriers to Theism account, the nonsignificant correlation between Barriers to Theism and generalized attitudes toward atheists,  $r = -.003, p = .958$ , contradicts this interpretation. Conversely, these results are also largely consistent with the Opposition to Theism account – and generalized attitudes are indeed associated with Opposition to Theism,  $r = -.29, p < .001$ . This relationship is subsequently assessed with correlational mediation analysis. The first contrast was consistent with anticipated results if atheist subgroup ratings are influenced by Indifference vs. Opposition and the second contrast was consistent with anticipated results if atheist subgroup ratings are influenced how challenging the barriers to theism are to overcome. The third contrast differentiates between the Opposition vs. Challenges to theism anticipated results supporting the former.

### ***Correlational Analyses***

Using correlational analyses, I investigated if OS prevalence estimates were predictive of generalized negative attitudes and, if so, which estimates were the strongest independent predictors. If the prevalence of a given origin story is associated with generalized negative attitudes, it can be inferred that atheists are viewed more [less] favorably when that origin story is viewed as more representative of atheists. In planned secondary analyses (analyses for which I did not make specific predictions), I also tested if sample (MTurk vs. University) and all possible two-way interactions<sup>4</sup> predicted generalized negative attitudes. A comprehension check for understanding the provided analogy for origin stories (that they may be comparable to conversion stories) revealed that only 5.5% of participants expressed confusion.

For the primary analysis, I conducted a hierarchical linear regression entering generalized attitudes towards *theists* in Step 1 and all four OS prevalence estimates in Step 2. Generalized attitudes toward theists was treated as a covariate, to help account for people's dispositional

**Table 1. Hierarchical Regression Analyses Predicting Generalized Attitudes Toward Atheists**

Predictor	b	SE	$\beta$	t
Step 1 – Generalized attitudes toward theists $R^2=.070, F(1,374) = 28.27, p < .001$				
Generalized attitudes toward theists	.350	.07	.265	5.32***
Step 2 – OS Prevalence Estimates $\Delta R^2=.027, p = .026$ $R^2=.097, F(5,370) = 7.99, p < .001$				
Generalized attitudes toward theists	.348	.07	.264	5.24***
Mindblind Atheism	-.111	.07	-.090	-1.61
Apatheism	-.013	.06	-.012	-.23
InCREDulous Atheism	-.027	.05	-.026	-.52
Analytical Atheism	.222	.07	.175	3.18**
Step 3 – Sample $\Delta R^2=.039, p < .001$ $R^2=.136, F(6,369) = 9.71, p < .001$				
Generalized attitudes toward theists	.380	.07	.288	5.80***
<b>Mindblind Atheism</b>	-.097	.07	-.079	-4.43
<b>Apatheism</b>	-.051	.06	-.048	-.90
<b>InCREDulous Atheism</b>	-.005	.05	-.005	-.105
<b>Analytical Atheism</b>	2.36	.07	.186	3.45**
Sample (Effect code: 1 = university, -1 = MTurk)	-5.19	1.27	-.20	-4.07***

**Note.** Boldface indicates the predictors of primary interest.

N = 376, \*\*\* =  $p < .001$ , \*\* =  $p < .01$

tendency to like people in general. When entered in Step 2, OS prevalence estimates significantly improved the predictive power of the model,  $\Delta R^2 = .027, p = .026$  (Table 1). Entering sample and all 2-way interactions (using the stepwise method) revealed that only the main effect of sample improved the model,  $\Delta R^2 = .039, p < .001$ . As the main effect of sample was easily significant and adding sample to the model only minimally changed Step 2 coefficients, I included the third step in the final model for interpretation.

Contrary to expectations, greater prevalence estimates for Analytical Atheism predicted *more* favorable generalized attitudes toward atheists,  $\beta = .186, t(376) = 3.45, p = .001$ .



Prevalence estimates for the three other origin stories were not a significant predictor of generalized attitudes. Entering sample in the model revealed that university participants ( $M_{\text{adjusted}} = 48.25, SD = 25.04$ ) had less favorable generalized attitudes toward atheists than MTurk participants ( $M_{\text{adjusted}} = 58.53, SD = 25.74$ ),  $\beta = -.203, t(384) = -4.07, p < .001$ .

### ***Indirect Effects***

I assessed the indirect effects of OS Prevalence Estimates on generalized attitudes through their effect on Opposition to Theism and Barriers to Theism. All analyses were conducted using the Preacher and Hayes method (2008) and include generalized attitudes toward theists as a covariate. Following-up on the positive relationship between Analytical Atheism prevalence estimates and generalized attitudes toward atheists, I did not observe an indirect effect through Opposition to Theism mediation,  $\beta = -.013 [-.049, .019]$ . This observation was driven by the absence of an association between the Analytical Atheism and Opposition to Theism,  $r_p = .046, p = .410$ .

While there was not a significant total effect of InCREDulous Atheism prevalence estimates on generalized attitudes,  $p = .469$ , I did observe an indirect effect,  $\beta = -.045 [-.083, -.013]$ , mediated by Opposition to Theism. Including the indirect effect in the model explained substantial additional variance in generalize attitudes,  $\Delta R^2 = .083$ . Overall, InCREDulous Atheism prevalence estimates are positively associated with perception that atheists are opposed to theism which are, in turn, associated with less favorable attitudes toward atheists. However, the association between InCREDulous Atheism and Opposition to Theism, while significant, is notably small,  $r_p = .155, p = .003$  – suggesting that InCREDulous Atheism prevalence estimates may only influence generalized attitudes when they first influence perceptions that atheists are opposed to theism.

Similarly, there was not a significant total effect of Mindblind Atheism prevalence estimates on generalized attitudes,  $b = -.030, p = .659$ , but I did observe an indirect effect,  $b = -.034, [-.083, -.013]$ , mediated by Opposition to Theism. Considering the indirect effect in the model explained substantial additional variance in generalize attitudes,  $\Delta R^2 = .084$ . Overall Mindblind Atheism prevalence estimates are positively associated with perception that atheists are opposed to theism,  $r_p = .116, p = .027$ , which is, in turn, associated with less favorable attitudes toward atheists  $r_p = -.299, p < .001$ . For the same mediation analysis of Apatheism prevalence estimates, I did not observe a direct effect,  $b = .024 [-.056, .013]$ , nor an indirect effect,  $b = -.020 [-.056, .013]$ .

Given the small association between Barriers to Theism and generalized attitudes,  $r_p = .005$  (controlling for generalized attitudes toward theists), it was unsurprising that all indirect affects between OS prevalence estimates and generalized attitudes, mediated by Barriers to Theism, were nonsignificant. Indirect effect 95 % confidence intervals from 5000 bootstrapped samples for unstandardized coefficients were  $[-.037, .021]$ ,  $[-.008, .006]$ ,  $[-.022, .027]$ , and  $[-.010, .011]$  for, Analytical Atheism, InCREDulous Atheism, Mindblind Atheism, and Apatheism respectively.

## **Distrust**

Distrust of atheists was measured with a two-item scale measuring trust and belief that atheists can be depended on to behave morally. Past work has shown that the association between distrust of atheists and anti-atheist prejudice is robustly mediated by a belief that people behave better when they perceive supernatural surveillance. Thus, I expected that perceptions of origin stories would have little effect on distrust, as all origin stories result in a disbelief in supernatural surveillance. Interestingly, it appeared that generalized negative attitudes and

distrust were interpreted similarly by theist participants. Not only were these attitudes strongly associated for atheist targets  $r = .834$  – which was consistent with past work finding prominent effects of distrust of atheist on generalized attitudes toward atheist – but these attitudes were also strongly associated for theist targets,  $r = .703$ . Atheist participants also interpreted these measures similarly as distrust was strongly associated with generalized negative attitudes for both theist targets,  $r = .728$ , and atheist targets,  $r = .716$ .

### ***Experimental Analyses***

I again conducted a 4 (Atheist Subtype: Mindblind vs. Apatheism vs. InCREDulous vs. Analytical) x 2 (Sample: University vs. MTurk) mixed ANOVA to assess effects on trust. The aim of this analysis was to infer if atheist subtype influences distrust of atheists and to see if this effect differed between samples. All within subject analyses used a Greenhouse-Geisser adjustment for mild non-sphericity. While I did not expect atheist subtype to have an effect on distrust of atheists, I observed a small but significant main effect of Atheist Subtype,  $F(2.8, 1028.9) = 15.60, p < .001, \eta_p^2 = .040$ . I also observed a main effect for sample such that MTurk participants trusted atheists more ( $M = 58.65, SE = 1.59$ ) than did university participants ( $M = 51.95, SE = 1.54$ ),  $F(1,370) = 9.12, p = .003, \eta_p^2 = .024$ . Analysis also revealed a significant interaction between Sample and Atheist Subtype,  $F(2.8, 1028.9) = 3.65, p = .014, \eta_p^2 = .010$ .

Following up on the interaction, I analyzed the simple effect of Atheist Subtype for both samples independently. For MTurk participants there was not a significant effect of Atheist Subtype,  $F(2.53, 1028) = 2.23, p = .097, \eta_p^2 = .012$ . However, for university participants I observed a significant effect of Atheist Subtype,  $F(2.85, 1028) = 17.18, p = .001, \eta_p^2 = .083$ . As there were no planned contrasts for an effect of Atheist Subtype, I performed Sidak adjusted post hoc contrasts for all pairs of atheist subtypes. Contrasts revealed that InCREDulous atheists were

significantly more trusted ( $M = 56.97, SD = 21.81$ ) than Apatheists ( $M = 47.98, SD = 24.81$ ),  $t(192) = 6.71, p < .001, d = .49$ , Mindblind Atheists ( $M = 51.18, SD = 22.40$ ),  $t(191) = 4.51, p < .001, d = .33$ , and Analytical Atheists ( $M = 51.74, SD = 23.43$ ),  $t(191) = 3.98, p = .001, d = .29$ . Additionally, Analytical Atheists were more trusted than Apatheists,  $t(191) = 3.14, p = .012, d = .23$ . The remaining contrasts did not reveal significant differences (adjusted p-values  $\geq .106$ ).

### ***Correlational Analyses***

I used the same regression model I previously used to predict variance in generalized attitudes but this time to predict trust of atheists. If the prevalence of a given origin story is associated with trust, it can be inferred that atheists are viewed as more [less] trustworthy when that origin story is viewed as more representative of atheists.

I again conducted a hierarchical linear regression entering trust of *theists* in Step 1 and all four OS prevalence estimates in Step 2. Trust toward theists was treated as a covariate, to help account for people's dispositional tendency to trust people in general. Contrary to expectations, OS prevalence estimates significantly improved the predictive power of the model,  $\Delta R^2 = .038, p = .003$  (Table 2). Entering sample and all 2-way interactions (using the stepwise method) revealed that only the main effect of sample improved the model,  $\Delta R^2 = .026, p = .001$ . As with the generalized attitudes regression, because the main effect of sample was easily significant and adding sample to the model only minimally changed Step 2 coefficients, I again included the third step in the final model for interpretation. Contrary to expectations, greater prevalence estimates for Analytical Atheism predicted *greater* trust of atheists,  $\beta = .210, t(180) = 4.0, p < .001$ . Prevalence estimates for the three other origin stories were not a significant predictor of trust. Entering sample in the model revealed that university participants ( $M_{\text{adjusted}} = 51.31, SD = 23.78$ ) trusted atheists less than MTurk participants ( $M_{\text{adjusted}} = 59.31, SD = 24.88$ ),  $\beta = -.203,$

**Table 2. Hierarchical Regression Analyses Predicting Trust of Atheists**

Predictor	<i>b</i>	<i>SE</i>	$\beta$	<i>t</i>
Step 1 – Trust of theists				
$R^2=.112, F(1,374) = 47.02, p < .001$				
Trust of theists	.447	.07	.334	6.86***
Step 2 – OS Prevalence Estimates				
$\Delta R^2=.038, p = .003$				
$R^2=.150, F(5,370) = 13.05, p < .003$				
Trust of theists	.445	.07	.332	6.89***
Mindblind Atheism	-.091	.06	-.078	-1.44
Apatheism	-.023	.05	-.022	-.44
InCREdulous Atheism	-.058	.05	-.058	-1.20
Analytical Atheism	.243	.065	.201	3.77***
Step 3 – Sample				
$\Delta R^2=.026, p = .001$				
$R^2=.176, F(6,369) = 13.14, p < .001$				
Trust of theists	.459	.06	.343	7.20***
<b>Mindblind Atheism</b>	-.077	.06	-.066	-1.24
<b>Apatheism</b>	-.054	.05	-.053	-1.03
<b>InCREdulous Atheism</b>	-.042	.05	-.043	-.883
<b>Analytical Atheism</b>	.255	.06	.210	4.00***
Sample (Effect code: 1 = university, -1 = MTurk)	-4.04	1.18	-.165	-3.42**

**Note.** Boldface indicates the predictors of primary interest.

N = 376, \*\*\* =  $p < .001$ , \*\* =  $p < .01$ .

$t(384) = -4.07, p < .001$ .

### ***Indirect Effects***

I used Process to test the indirect effects of OS Prevalence Estimates on trust, through OS Prevalence estimates influence beliefs that morality is encouraged by perceptions of supernatural surveillance (i.e., the Supernatural Surveillance account. I again used the Preacher and Hayes method (2008) and included trust of theists as a covariate. Following-up on the positive relationship between Analytical Atheism prevalence estimates and distrust of atheists, I did not observe an indirect effect through Supernatural Surveillance mediation,  $\beta = .006 [-.030, .040]$ .

This observation was driven by the absence of an association between Analytical Atheism and Supernatural Surveillance,  $r_p = -.018, p = .737$ .

While there was not a significant total effect of InCREDulous Atheism prevalence estimates on trust,  $\beta = -.072, b = -.070 [-.166, .026], p = .150$ , I did observe an indirect effect,  $\beta = -.045, b = -.044 [-.080, -.010]$ , through Supernatural Surveillance. Including the indirect effect in the model explained substantial additional variance in trust,  $\Delta R^2 = .098$ . Probing the indirect effect, I observed that InCREDulous Atheism prevalence estimates are positively associated with beliefs that morality is encouraged by perceptions of supernatural surveillance,  $r_p = .141, p = .007$ , which is, in turn, associated with less favorable attitudes toward atheists  $r_p = -.331, p < .001$ . These results suggest that when InCREDulous Atheists are perceived to be more representative of atheists, atheists are more distrusted. But, importantly, this pattern only holds when greater prevalence estimates for Mindblind Atheists are associated with a stronger belief that perceptions of supernatural surveillance encourage morality.

Similarly, there was not a significant total effect of Mindblind Atheism prevalence estimates on trust,  $\beta = -.016, b = -.019 [-.134, .097], p = .754$ , but I did observe an indirect effect,  $\beta = -.052, b = -.061 [-.107, -.021]$ , mediated by Supernatural Surveillance. Considering the indirect effect in the model explained substantial additional variance in generalize attitudes,  $\Delta R^2 = .103$ . Probing the indirect effect, I observed that Mindblind Atheism prevalence estimates are positively associated with perception that atheists are opposed to theism,  $r_p = .158, p = .002$ , which is, in turn, associated with less favorable attitudes toward atheists  $r_p = -.339, p < .001$ . These results suggest that when Mindblind Atheists are perceived to be more representative of atheists, atheists are more distrusted. Again, this pattern only holds when Mindblind Atheism prevalence estimates are also positively associated with beliefs that perceptions of supernatural

surveillance encourage morality. For mediation analysis of Apathism prevalence estimates, I did not observe a direct effect,  $b = -.013 [-.108, .083]$ , nor an indirect effect,  $b = .005 [-.032, .044]$ .

## **Pity**

Pity of atheist was measured with a two-item scale measuring pity for atheists and the extent to which participants felt sorry for atheists. Past work has shown that perceptions of low competence is an important factor in predicting pity toward an outgroup. Thus, if pity of atheists is driven by perceptions of low competence, I would expect Mindblind atheism to be predictive of more pity of atheists compared to Apathism and Analytical Atheism (with InCREDulous Atheism between the extremes).

## ***Experimental Analyses***

I again conducted a 4 (Atheist Subtype: Mindblind vs. Apathism vs. InCREDulous vs. Analytical) x 2 (Sample: University vs. MTurk) mixed ANOVA to assess effects on pity. The aim of this analysis was to infer if atheist subtype influences pity of atheists and to see if this effect differed between samples. I again used a Greenhouse-Geisser adjustment for mild non-sphericity. As expected, I observed a significant main effect of Atheist Subtype,  $F(2.8, 1035.8) = 29.53, p < .001, \eta_p^2 = .074$ . I also observed a main effect for sample such that university participants pitied atheists more ( $M = 51.15, SE = 1.97$ ) than did MTurk participants ( $M = 43.34, SE = 2.04$ ),  $F(1,370) = 4.20, p = .041, \eta_p^2 = .011$ . Of greater interest than the Sample main effect was the observed Sample x Atheist Subtype interaction,  $F(2.8, 1035.8) = 4.72, p = .004, \eta_p^2 = .013$ .

Following up on this interaction, I analyzed the simple effect of Atheist Subtype for both samples independently. There was a significant simple effect of Atheist subtype for both the

university sample,  $F(2.6, 503.9) = 27.01, p < .001, \eta_p^2 = .124$ , and the MTurk sample,  $F(2.8, 499.5) = 6.54, p < .001, \eta_p^2 = .035$ . However, the effect of Atheist Subtype was notably larger for university participants compared to MTurk participants. I followed up on these simple effects with a planned contrast comparing pity of Mindblind Atheists against mean pity for Apatheists and Analytical Atheists combined. For university participants Mindblind atheists were not significantly more pitied ( $M = 49.60, SD = 27.41$ ) than Apatheists and Analytical Atheists ( $M = 47.49, SD = 28.02$ ),  $t(191) = 1.63, p = .104, d = .12$ . However, conforming to expectations, MTurk participants did pity Mindblind Atheists significantly more ( $M = 45.80, SD = 31.19$ ) than Apatheists and Analytical Atheists ( $M = 42.52, SD = 30.08$ ),  $t(183) = 2.62, p = .009, d = .19$ . While effect sizes were small, these results provided partial support for the hypothesis that Mindblind Atheists would be more pitied than Apatheists and Analytical Atheists. But it seems like this difference may not apply to my university participants.

### ***Correlational Analyses***

I again used the previously described regression model to predict variance pity of atheists. If the prevalence of a given origin story is associated with pity, it can be inferred that atheists are more [less] pitied when that origin story is viewed as more representative of atheists.

I conducted a hierarchical linear regression entering pity of *theists* in Step 1 and all four OS prevalence estimates in Step 2. Pity toward theists was treated as a covariate, to help account for people's dispositional tendency to pity people in general. Contrary to expectations, OS prevalence estimates failed to improve the predictive power of the model,  $\Delta R^2 = .012, p = .288$  (Table 3). Entering sample and all 2-way interactions (using the stepwise method) revealed that the model was improved by entering both the main effect of sample,  $\Delta R^2 = .013, p = .020$ , in Step 3, and the Mindblind x Apatheism interaction in Step 4,  $\Delta R^2 = .013, p = .021$ . While I did



**Table 3. Hierarchical Regression Analyses Predicting Pity of Atheists**

Predictor	<i>b</i>	<i>SE</i>	$\beta$	<i>t</i>
Step 1 – Pity of theists $R^2=.082, F(1,374) = 33.47, p < .001$				
Pity of theists	.375	.07	.287	5.79***
Step 2 – OS Prevalence Estimates $\Delta R^2=.012, p = .288$ $R^2=.094, F(5,370) = 7.72, p < .003$				
Pity of theists	.391	.07	.299	5.92***
Mindblind Atheism	.127	.08	.085	1.54
Apatheism	-.071	.07	-.054	-1.02
InCREDuulous Atheism	-.013	.06	-.010	-.205
Analytical Atheism	.082	.09	.053	.958
Step 3 – Sample $\Delta R^2=.013, p = .020$ $R^2=.108, F(6,369) = 7.41, p < .001$				
Pity of theists	.405	.07	.309	6.14***
Mindblind Atheism	.113	.08	.076	1.38
Apatheism	-.043	.07	-.033	-.62
InCREDuulous Atheism	-.029	.06	-.023	-.46
Analytical Atheism	.073	.09	.048	.864
Sample (Effect code: 1 = university, -1 = MTurk)	3.64	1.57	.117	2.327*
Step 4 – Mindblind x Apatheism interaction $\Delta R^2=.013, p = .021$ $R^2=.120, F(7,368) = 7.20, p < .001$				
Pity of theists	.409	.07	.313	6.24***
<b>Mindblind Atheism</b>	.122	.08	.082	1.50
<b>Apatheism</b>	-.037	.07	-.028	-.53
<b>InCREDuulous Atheism</b>	-.022	.06	-.018	-.35
<b>Analytical Atheism</b>	.108	.09	.07	1.26
Sample (Effect code: 1 = university, -1 = MTurk)	3.70	1.56	.119	2.38*
<b>Mindblind x Apatheism</b>	.006	.003	.117	2.32*

**Note.** Boldface indicates the predictors of primary interest.

N = 376, \*\*\* =  $p < .001$ , \*\* =  $p < .01$  \* =  $p < .05$ .

not make predictions for Step 3 or Step 4 variables, because the inclusion of the variable led to minimal adjustments of Step 2 coefficients, I interpreted only the full model.

Contrary to expectations prevalence estimates for Mindblind Atheists were not positively associated with pity,  $\beta = .082, t(368) = 1.50, p = .136$ . Also contrary to expectations, neither

Analytical Atheism nor Apathism prevalence estimates were negatively associated with pity,  $\beta = .082, t(368) = 1.26, p = .207$ ;  $\beta = -.028, t(368) = -.52, p = .598$ . I did observe a significant interaction effect of Mindblind Atheism x Apathism such that greater Mindblind Atheism prevalence estimates predicted greater pity, but only when prevalence estimates for Apathists were also greater,  $\beta = .117, t(368) = 2.32, p = .021$ . Finally, the regression revealed that university participants ( $M_{\text{adjusted}} = 50.70, SD = 30.03$ ) pitied atheists more than MTurk participants ( $M_{\text{adjusted}} = 43.24, SD = 30.02$ ),  $\beta = .119, t(384) = 2.38, p = .018$ . Overall, these correlational results were counter to predications but also suggest a conditional restriction on the association between Mindblind Atheism and pity. Namely, that Atheists are pitied more when they are not only seen as Mindblind but also Apathetic.

### ***Indirect Effects***

While independent OS prevalence estimates were not found to directly predict pity, we assessed the possibility that they indirectly effect pity by first effecting perceptions of atheists' competence. I again assessed this possibility using the Preacher and Hayes method (2008) and included pity of theists as a covariate. I observed that Mindblind Atheism prevalence estimates did not have an indirect effect on atheist pity through perceptions of atheist competence  $\beta = -.013, b = -.019 [-.046, .004]$ . Further probing revealed a surprising *positive* association between Mindblind Atheism prevalence estimates and competence,  $r_p = .105, p = .045$ . In turn, competence was negatively associated with pity,  $r_p = -.128, p = .015$ . When controlling for the nonsignificant, negative indirect effect, the direct effect of Mindblind Atheism prevalence estimates on pity was trending toward significance in the anticipated direction,  $\beta = .092, b = .139 [-.009, .287], p = .066$ .

I also did not observe an indirect effect of InCREDulous Atheism prevalence estimates on pity  $\beta = .009$ ,  $b = .011$  [-.004, .038], nor a direct effect,  $\beta = -.003$ ,  $b = -.004$  [-.130, .121]. Similarly, I did not observe an indirect effect of Apatheism prevalence estimates on pity  $\beta = .001$ ,  $b = .002$  [-.015, .023], nor a direct effect,  $\beta = -.019$ ,  $b = -.025$  [-.154, .105].

While I did not observe a total effect of Analytical Atheism prevalence estimates on pity,  $\beta = .063$ ,  $b = .098$  [-.056, .251], I did observe an indirect effect through competence,  $\beta = -.026$ ,  $b = -.040$  [-.085, -.006]. Including the indirect effect in the model explained substantial additional variance in trust,  $\Delta R^2 = .053$ . Probing the indirect effect, revealed that Analytical Atheism prevalence estimates are positively associated with perceptions of atheists' competence,  $r_p = .197$ ,  $p < .001$ , and perceptions of atheists' competence are negatively associated with pity of atheists,  $r_p = -.134$ ,  $p = .011$ . This suggests that when, but only when, theists associated Analytical atheism with greater competence, and consider Analytical Atheism to be highly representative of atheists, they pity atheists less.

## DISCUSSION

### **Conclusions**

Throughout this study, perceptions of atheists' origin stories appear to be a meaningful factor for understanding prejudice toward atheists - regardless of the methods by which origin stories are evaluated. It may also be illuminating that opposition to theism, moral beliefs about supernatural surveillance, and competence were observed to have moderately large effects on generalized negative attitudes, distrust, and pity, respectively. This research also found some support for the possibility that, in some cases, these process variables account for an indirect effect between origin story perceptions and anti-atheist prejudice. While evidence regarding pity of atheists was somewhat mixed, the present study is the first research, to my knowledge, to support the possibility that pity is a prejudicial emotional response that applies to atheists in particular. This specific emotional response may often coincide with distrust of atheists. Overall, these results may serve to enhance our understanding of how beliefs about what atheists believe (i.e., meta-beliefs) may can effect prejudice against atheists.

### ***Considering the Four Accounts***

I found mixed but primarily contradictory evidence for the Opposition to Theism account—the prediction that some origin stories are related to perceptions of atheists being opposed to theism and that, in turn, this perceived opposition causes less favorable attitudes. Evidence suggested that perceptions of atheists being opposed to theism are indeed predictive of less favorable attitudes. But origin stories may not relate to perceptions of opposition as was anticipated. Correlational analyses suggested that not only did estimating there are more

analytical atheists predict *more* favorable generalized attitudes towards atheists (contrary to my prediction), but also that analytical atheism was not related to perceptions of Atheists' opposition to theism. Furthermore, estimating there are more InCREDulous atheists was associated with seeing atheists in general as *more* opposed to theism. Thus, it appears that, unexpectedly, seeing InCREDulous Atheists as more representative of atheists may cause less favorable attitudes toward atheists. However, experimental analyses, were generally supportive of the Opposition to Theism account. Results suggest that both Apatheists and InCREDulous Atheists are viewed more favorably than Analytical Atheists. This finding directly contradicts the correlational findings (see Interpretations and Limitations for further discussion).

Evidence contradicted the Barriers to Theism account – the prediction that some origin stories are related to perceptions that coming to believe in God(s) would be a challenging endeavor for atheists and, in turn, this perception causes less favorable attitudes. Perceived barriers to theism were not related to generalized attitudes toward atheists.

Evidence was generally supportive of the Supernatural Surveillance account for MTurk participants but mixed for university participants. First, the Supernatural Surveillance account predicts that theists' belief that people behave better under supernatural surveillance drives distrust of atheists; critically, atheists inherently do not believe they are under supernatural surveillance. Second, this account predicts that theists' perceptions of atheists' origin stories are unrelated to theists' belief that supernatural surveillance encourages morality. Therefore, evidence would be consistent with this account when perceptions of atheists' origin stories are found to be unrelated to distrust of atheists. Correlational analyses largely supported this account in that, with one exception, OS prevalence estimates were unrelated to distrust of atheists. Contradicting this account, I found that when analytical atheists were seen as more representative

of atheists, distrust was greater for atheists in general. Consistent with this account, I found that MTurk participants did not have different degree of distrust for different atheist subtypes.

University participants trusted InCREDulous more than the other three subtypes.

I found mixed evidence for the Competence account – the prediction that some origin stories are related to perceptions of atheists’ competence and, in turn, perceptions that atheists are low in competence causes greater pity of atheists. Evidence suggested that perceptions that atheists are low in competence are indeed predictive of more pity of atheists. Assessing the role of origin stories, correlational analysis found viewing some types of atheists as more or less representative of atheists in general did not affect pity of atheists. However, while not a finding for which I made predictions, viewing atheists who are *both* Mindblind and Apatheists as more representative of atheists predicted more pity toward atheists. In support of the Competence account, evidence suggests that seeing Analytical Atheists as more representative atheists may cause perceptions that atheists are more competent, which, in turn, may cause less pity of atheists in general. Finally, experimental analyses supported the Competence account – at least for MTurk participants. MTurk participants pitied Mindblind Atheists more than either Apatheists or Analytical Atheists. I did not find support for this difference for university participants.

Overall, experimental analyses generally supported three out of the four accounts for MTurk participants (but not university participants), while correlational analyses generally failed to support any of the accounts. While perceptions of atheists’ origin generally helped explain anti-atheist prejudice (distrust to a lesser degree than generalized negative attitudes), understanding *which* origin story perceptions cause prejudice (in its various forms) will require future research.

## **Interpretations and Limitations**

Given the generally mixed evidence of my results, attaching even moderate confidence to conclusions seems unwarranted. Most notably, the contradictions tended to center on opposing results between the correlational and experimental analyses. The correlational results seem the more likely of the two to not effectively measure the intended conceptual question -- whether theists feel differently about atheists depending on their reasons for deity disbelief. My correlational hypotheses heavily relied on the assumption that greater OS prevalence estimates were indicative of thinking that the origin story in question was more representative of atheists in general. But these prevalence estimates along with prevalence estimates could actually covary based on a myriad of third factors in which case any associations, or lack thereof, could be spurious; in addition to the fact that the variable were not experimentally manipulated and we therefore cannot infer causality. While this is inherently a possibility with correlational analyses (in particular), in this case it seems reasonable to speculate about the role of one factor in particular: accuracy for atheists' origin stories.

The most prominent contradictions observed were that: 1) Correlational analyses appear to suggest that InCREDulous Atheists are among the least favored subtypes, while experimental analyses suggest they are clearly the most favored subtype<sup>5</sup> (with the exception of pity), and 2) Correlational analyses suggest Analytical Atheists are the most favored subtype, while experimental analyses suggest they are only moderately liked relative to the other subtypes. Therefore, it may be critical to note that greater InCREDulous Atheism prevalence estimates coincide with greater inaccuracy regarding atheists' origin stories, while greater Analytical Atheism prevalence estimates coincide with greater accuracy. While greater accuracy for atheist origin stories may not directly cause less prejudice accuracy regarding atheists may be linked to

spending quality time with atheists (which *is* likely to cause less prejudice). In conclusion, it may actually be increases [decreases] in accuracy of atheist perceptions that explain the positive [negative] associations between OS prevalence estimates and anti-atheist prejudice. While speculative, this possibly seem worthy of future investigation.

### **Implications**

While results were generally inconclusive the present work may serve to further highlight the importance of theists' meta-beliefs in understanding anti-atheist prejudice. In particular, the results strongly supported that theists' perceptions of whether atheists are indifferent to the religious beliefs of others or actively opposes all theistic endorsements is related to prejudice against atheists. While this study did not conclusively provide evidence that origin story meta-beliefs influence prejudice, attitudes of atheists in response to their different origin stories were consistently varied. These current findings imply that further exploration of this topic may prove to be a productive endeavor.



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## ENDNOTES

<sup>1</sup>Using difference score between ingroup and outgroup (i.e., prejudice) as the dependent variable also control for ingroup attitudes but can present other methodological disadvantages which are beyond the scope of this article.

<sup>2</sup>The perspective that atheism is the default position (as this group is defined by the absence of a belief), rather than something that one “becomes,” is a reasonable alternative characterization. Such questions are beyond the scope of this article as we are merely interested in theists’ perceptions of why atheists hold this identity regardless of theism or atheism is considered the default identity.

<sup>3</sup>These interactions are: 1) Mindblind × Apatheism, 2) Mindblind x InCREDulous, 3) Mindblind × Analytical, 4) Apatheism × InCredulous, 5) Apatheism × Analytical, 6) InCredulous × Analytical, 7) Sample × Mindblind, 8) Sample × Apatheism, 9) Sample × InCREDulous, and 10) Sample × Analytical.

<sup>4</sup>Results for Mindblind Atheists mirror this contradictory pattern for InCREDulous Atheists thought to a less dramatic degree.

## APPENDIX



Office of the Vice President for  
Research & Economic Development  
Office for Research Compliance

February 13, 2018

Alexander McDiarmid  
Department of Psychology  
College of Arts and Sciences  
Box 870348

Re: IRB # 18-OR-055, "Narratives for Adopting Group Beliefs"

Dear Mr. McDiarmid:

The University of Alabama Institutional Review Board has granted approval for your proposed research.

Your application has been given expedited approval according to 45 CFR part 46. You have also been granted the requested waiver of written documentation of informed consent and waiver of one element of informed consent. Approval has been given under expedited review category 7 as outlined below:

*(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.*

Your application will expire on February 11, 2019. If your research will continue beyond this date, please complete the relevant portions of the IRB Renewal Application. If you wish to modify the application, please complete the Modification of an Approved Protocol form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, please complete the Request for Study Closure form.

Should you need to submit any further correspondence regarding this proposal, please include the above application number.

Good luck with your research.

Sincerely,