Preliminary Evidence for an Aversion to Atheists in Long-Term Mating Domains

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Abstract

The centrality of religiosity in selecting long-term mates suggests the espousal of atheism could be undesirable for that context. Given recent findings suggesting the presence of several positive stereotypes about atheists, a largely distrusted group, it could be possible individuals prefer atheists in mating domains not emphasizing long-term commitment (i.e., short-term mating). I conducted two studies tasking participants with evaluating long-term and short-term mating desirability of theists and atheists while assessing perceptions of their personalities. Study 1 indicated atheists were perceived as more desirable in short-term mating than long-term mating, though this preference did not translate to being preferred in that context over theists. Study 2 demonstrated this effect is specific to physically attractive targets. I further found atheists were perceived as more prone to infidelity, especially if they were attractive. I frame results from an evolutionary perspective while discussing the pervasiveness of anti-atheist prejudice.

Keywords: Atheism, Mate preferences, Evolutionary psychology, Infidelity, Stereotyping

Selecting a long-term mate is contingent upon whether one is capable of engaging in the behaviors necessary to facilitate biparental investment and contribute to a lasting pairbond. Humans rely on various social affordance judgments to identify prospective mates' interests, with certain behavioral repertoires being utilized to infer mating intentions (Williams, Sng, & Neuberg, 2020). Religious beliefs are one possible route through which one could infer a prospective mate's capabilities in a long-term pairbond, given that religiosity is a robust predictor of personality traits associated with monogamous intent (Schmitt & Fuller, 2015; Schmitt & Shackelford, 2008) and perceived as a cue to slow life history strategies that favor the requisite monogamy for optimal biparental investment (Moon, Krems, & Cohen, 2018). Heuristic stereotypes of theists could facilitate perceptions of their desirability in long-term mating. This preference for long-term mates belong to organized religion is cross-cultural, both in individuals' preferences (Buss & Barnes, 1986; Thomas et al., 2020) and those of their parents (Dubbs & Buunk, 2010; Perilloux, Fleischman, & Buss, 2011). In fact, the presence of mating competition heightens espousal of religious beliefs (Li, Cohen, Weeden, & Kenrick, 2010).

This preference for theistic mates in monogamous pairbonds begs the question of the potential mate value of atheists, or those lacking religious beliefs. In addition to prevalent distrust toward atheists (Gervais et al., 2017), recent studies suggest 49% of respondents would be upset if a family member married an atheist (Pew Research Center, 2014), with individuals preferring long-term mating strategies being quick to condemn them (Moon, Krems, & Cohen, 2020). Despite this potential undesirability in long-term contexts, various benefits are nonetheless inferred in atheists that implicate them as potentially having some desirability in other mating domains. Atheists are perceived as interested in short-term sexual encounters and regarded as particularly fun (Moon et al., 2018, in press), which could suggest atheistic mates are

more desirable as short-term mates. This program of research sought to identify how stereotypes of theistic and atheistic individuals in mating domains shape subsequent mate preferences.

Anti-Atheist Attitudes

The criticality of group living to human survival necessitates identification of conspecifics capable of facilitating reciprocal altruism. One route through which individuals could signal this capability is adherence to intuitive beliefs disallowing interpersonal harms, which foster perceptions of trustworthiness necessary to facilitate attraction (e.g., Everett, Pizarro, & Crockett, 2016; Montoya & Insko, 2008; Sacco, Brown, Lustgraaf, & Hugenberg, 2017). This adherence can be signaled through religiosity, with theists being deemed trustworthy (Brown-Iannuzzi, McKee, & Gervais, 2021). Though not every culture subscribes to the notion of a “high God” typical of Western cultures (Peregrine, 1996; Swanson, 1960), a cross-cultural consistency nonetheless emerges for the invocation of a narrative describing supernatural origins of humanity. These shared narratives subsequently form the basis of an ingroup identity with which individuals signal group membership by affirming their belief in a narrative (Purzycki & Sosis, 2011). This affirmation could have historically afforded access to expansive communities through a shared identity wherein theism would foster trust between members (Henrich, 2009; Matthews, 2012 Van Vugt & Schaller, 2008). Even if one’s religiosity differs from one group to another, adherence to a religious affiliation could connote general interest in group rules that the mere espousal of belief could implicate an individual as trustworthy regardless of religion.

Given the trustworthiness signaled through religiosity (Clifford & Gaskins, 2016), nonadherence to institutions that ostensibly serve as the basis for social rules could implicate individuals as disinterested in participating in reciprocal altruism and more capable of exploiting others. Distrust is the basis of considerable anti-atheist prejudice. Cross-cultural evidence

indicates an intuitive belief that immoral and deceptive behaviors are more typical of an atheist behavioral repertoire that does not extend to members of outgroup religions (e.g., Christians evaluating Muslims; Brown-Iannuzzi et al., 2019; Gervais, Shariff, & Norenzayan, 2011; Gervais et al., 2017). Interestingly, this anti-atheist prejudice even extends to other atheists, which could be rooted in the lack of shared identity between atheists. This distrust manifest as disbelief in atheist mates to engage in typical monogamous behavior, particularly among those dispositionally interested in monogamous reproductive strategies (Moon et al., 2020), which would reduce their desirability as marital partners.

Despite this distrust, atheism in its various forms remains a prevalent epistemology, with some estimates indicating an 11% prevalence worldwide (Gervais & Naijle, 2018). This suggests there to be benefits to their historical inclusion in group living despite the perceived costs of this inclusion. Recent work demonstrates the existence of several positive stereotypes about atheists, including perceptions of them as being more fun, open-minded, and analytic; these perceptions subsequently became the basis of individuals desiring to interact with atheists in relevant domains (Moon, Krems, & Cohen, in press). The unconventionality of atheists may further present downstream cues of additional benefits to one's inclusive fitness for tasks less relevant to cooperation. Within mating domains, this could extend into perceptions of their interest in promiscuous mating strategies that are common among those reporting greater openness to experience (Moon et al., 2018; Schmitt & Shackelford, 2008).

Mate Preferences for Cues to Morality

Successful reproduction is predicated upon identifying traits implicating prospective mates capable of satisfying reproductive goals. Selection favored mates exhibiting traits connoting heritable fitness that would produce healthy offspring and behaviors indicating

investment potential (Trivers, 1972). Given the improbability of selecting a mate equally capable of providing both heritable fitness and investment equally, individuals prioritize one set of traits over the other in a tradeoff, resulting in the adoption of short- (STM) or long-term mating (LTM) strategies (Buss & Schmitt, 1993; Li et al., 2013), to optimize one reproductive goal over another. STM emphasizes acquisition of multiple partners for uncommitted sexual encounters and prioritization of physical attractiveness (Li & Kenrick, 2006). Women prefer muscular men in STM for its fitness connotation (Frederick & Haselton, 2007), and STM-oriented men particularly value features of women's bodies purportedly connoting nubility (e.g., narrow waists) to increase reproductive success (Singh et al., 2010). Within STM, individuals further select mates inferred as employing promiscuous sexual strategies (Brown & Sacco, 2017). The heuristic association of atheism with promiscuity could similarly facilitate identification of prospective mates with consonant strategies while also reducing interest in theists from given their LTM interest (Jonason & Buss, 2012; Moon et al., 2018). Additionally, and akin to women's heightened interest in interpersonally dominant traits in STM (Marcinkowska, Helle, & Lyons, 2015), the stereotypes of atheists' immorality may only be relevant to selecting long-term mates, given the brief durations of STM could reduce the likelihood of exploitation.

Conversely, an orientation toward LTM upregulates motivation to establish monogamous, committed pairbonds and a concomitant prioritization of mates providing that opportunity. Prosociality is particularly desirable in LTM, especially among women (e.g., Barclay, 2010; Bhogal, Farrell, Galbraith, Manktelow, & Bradley, 2020; Brown, Westrich, Bates, Twibell, & McGrath, 2020). Men's prosociality is frequently regarded as a courtship display, with women inferring long-term potential through a prosocial behavioral repertoire. These behaviors could signal men's likelihood of investing in pairbonds, thereby contributing to

offspring's survival into adulthood. This would be particularly attractive to women, given their larger minimal costs in reproduction (e.g., gestation, lactation) compared to men (e.g., sperm provision) and interest in identifying mates capable of offsetting costs (Trivers, 1972).

Another central challenge for LTM is identifying mates capable of commitment and fidelity. Recent findings indicate reflexive adherence to social rules that serves to signal intolerance of immorality heightens perceptions of LTM interest and desirability (Brown, Keefer, Sacco, & Brown, in press). Men and women perceive this adherence as monogamous intent (Brown & Sacco, 2019), likely rooted in their behavior's predictability that fosters trust (Jordan, Hoffman, Nowak, & Rand, 2016). Acuity toward LTM interest would solve an adaptive problem for both men and women, as selecting monogamous women would heighten men's confidence in paternal certainty, whereas men's fidelity indicates a proclivity to commit resources to the current pairbond to increase offspring's inclusive fitness (Platak & Shackelford, 2006). The signaled morality of theists elicits a heuristic association with interest in monogamy (Moon et al., 2018), which could augment LTM desirability like other signals to rule adherence. Cross-cultural evidence suggests religiosity is associated with greater interest in monogamous strategies (Schmitt & Fuller, 2015). When tasked with budgeting various traits for LTM, religiosity is a necessity to women (Thomas et al., 2020), which could assuage their skepticism toward men's commitment (Ackerman, Griskevicius, & Li, 2011). Additional work suggests reproductive benefits emerge for a theistic mate, including feelings of paternal certainty and access to alloparenting opportunities (Shaver, Sibley, Sosis, Galbraith, & Bulbulia, 2019).

Current Research

The current program of research sought to expand upon previous findings identifying additional social affordances of atheists within mating domains. I considered the desirability of

atheists in both STM and LTM contexts compared to theists to determine when individuals would invoke a tradeoff to prefer theists and atheists as mates to facilitate salient reproductive goals. I conducted two studies in this program to identify potential shifts in desirability of prospective mates as a function of religiosity (or lack thereof) across mating contexts. There was further consideration of whether the proposed tradeoff for atheists would be most apparent among highly attractive mates in a pre-registered study. I report all measures, manipulations, and exclusions in the manuscript herein. Data, materials, and syntax for both studies are available at: https://osf.io/fekbr/?view_only=a5c99046554b4e85bae0ea24f86992c8

Study 1

This initial study sought to identify the tradeoff individuals invoke to selecting mates that would satisfy salient reproductive goals. Specifically, given the lack of trustworthiness perceived in atheists, I predicted atheists to be less desirable in LTM contexts compared to religious individuals whose behavioral repertoire connotes an interest in monogamous strategies (e.g., Gervais et al., 2011; Moon et al., 2018). Conversely, because of the interest in promiscuity likely inferred through stereotypes about their openness (Moon et al., in press), I additionally predicted atheists would be more desirable in STM compared theists with this short-term desirability for atheists being greater than LTM. The considerably larger costs women face in reproduction that necessitate both a greater interest in LTM (Schmitt, 2003) and selecting mates whose behavior suggests greater capability to invest in offspring further led me to predict the emergence of sex differences in perceptions (Barclay, 2010; Brown et al., in press; Li et al., 2013). I predicted the preference for theism in LTM would be larger for women compared to men.

In addition to my central hypotheses for desirability, I sought to extend previous findings identifying the additional interpersonal affordance inferred through (a)theism. Given previous

work suggesting that non-adherence to social rules elicits perceptions of one being prone to infidelity (Brown & Sacco, 2019), I further predicted that atheists would be similarly perceived as prone to such. Finally, I tasked participants with indicating their perceptions of atheists and theists' personalities. Given previous findings suggesting atheists are perceived as open-minded (Moon et al., in press), I predicted atheists would be perceived as more open to experience compared to theists. Conversely, I predicted theists would be perceived as more conscientious and agreeable than atheists, a perception that would align with previous findings demonstrating these traits as a basis for theists' interest in monogamy (Schmitt & Fuller, 2015).

Method

Participants. I recruited 110 undergraduates from a public university in Southeastern U.S. in exchange for course credit. Four participants were excluded from final analyses for not reporting heterosexual attraction, as participants were tasked with evaluating opposite-sex targets. This resulted in a final sample of $n = 106$ (58 women, 48 men; $M_{Age} = 19.31$, $SD = 1.93$; 85.8% White). Among participants, 79.2% identified as believing in a god, 12.3% identified themselves as unsure, and 8.5% indicated not believing. Given previous research suggesting anti-atheist prejudice existed among other atheists (Gervais et al., 2011), I did not exclude any participants based on their religiosity in final analyses.¹

A sensitivity analysis indicated sufficient power to detect small effects for a within-subjects experimental design that considered a between-subjects factor of Participant Sex (Cohen's $f = .11$, $1 - \beta = .80$). Data were collected during the week before a midterm deadline for course credit in a semester, with the number of participants collected during the week serving as our stop rule. I did not analyze data until completion of that week.

Materials and Procedure. Participants were tasked with interfacing with a hypothetical

dating site where they would evaluate two prospective mates from the site, wherein participants would receive little information about them. Targets were represented by single images of neutrally expressive, White young adults of average attractiveness from the Aging Faces Database (Minear & Park, 2004). Men evaluated female targets and women evaluated male targets. Critically, a single statement accompanied each target indicating they were either theistic (i.e., This person believes in God) or atheistic (i.e., This person does not believe in God). We counterbalanced the identity of the atheist and theist and presented them in a randomized order.

Contextual Desirability. Targets were evaluated for desirability in STM and LTM contexts using single-item measures operating on 9-point scales (1 = *Very Undesirable*; 5 = *Average*; 9 = *Very Desirable*; Brown & Sacco, 2018).

Trait Inferences. I additionally tasked participants with evaluating targets' personality using both a single-item measure assessing the extent to which participants perceived each target as prone to cheating on a partner (1 = *Not at All*; 7 = *Very Much*; Brown & Sacco, 2019). Participants also indicated the extent each target appeared to exhibit Big Five traits using an other-report version of the Ten-Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003) that specifically considers perceptions of each trait (Brown et al., in press). Items operated along 7-point scales (1 = *Strongly Disagree*; 7 = *Strongly Agree*), with two items per each of the Big Five traits. Item reliabilities were low ($\alpha > .10$), though no values were atypical of short measures (Jonason & Webster, 2010). The subscales' positive alphas led me to aggregate them.

Results

Traits Inferences. I conducted six separate paired-samples *t*-tests comparing perceptions of both targets' personalities and their proclivity toward infidelity. Participants perceived the theistic target as more agreeable and conscientious while also perceiving the atheistic target as

more neurotic and prone to infidelity. No difference emerged in perceptions of openness and extraversion. See Table 1 for relevant statistics.

Mating Desirability. I conducted a 2 (Participant Sex: Male vs. Female) $\times$ 2 (Target Religiosity: Theist vs. Atheist) $\times$ 2 (Mating Context: STM vs. LTM) mixed-model ANOVA with repeated factors over the latter factor. A Target Religiosity main effect indicated participants found the theist ($M = 3.52$, $SD = 2.10$) more desirable than the atheist ($M = 2.70$, $SD = 1.80$), $F(1, 101) = 12.03$, $p = .001$, $\eta_p^2 = .106$. A Participant Sex main effect indicated men found the prospective mates more desirable ($M = 3.43$, $SD = 2.01$) than women ($M = 2.84$, $SD = 1.85$), $F(1, 101) = 5.16$, $p = .025$, $\eta_p^2 = .049$. No main effect emerged for Mating Context, $F(1, 101) = 0.03$, $p = .864$, $\eta_p^2 < .001$.

Effects were most superordinately qualified by a Target Religiosity $\times$ Mating Context interaction, $F(1, 101) = 18.77$, $p < .001$, $\eta_p^2 = .157$ (see Figure 1). Simple effects indicated the atheist was perceived as more desirable in STM ($M = 2.94$, $SD = 1.92$) than in LTM ($M = 2.46$, $SD = 1.68$), $F(1, 101) = 13.56$, $p < .001$, $\eta_p^2 = .118$. The theist was perceived as more desirable in LTM ($M = 3.75$, $SD = 2.18$) than in STM ($M = 3.29$, $SD = 2.02$), $F(1, 101) = 5.53$, $p = .021$, $\eta_p^2 = .052$. Viewed another way, the theist was more desirable in LTM than the atheist, $F(1, 101) = 21.99$, $p < .001$, $\eta_p^2 = .179$. No difference emerged in desirability for the atheist and theist in STM, $F(1, 101) = 2.13$, $p = .148$, $\eta_p^2 = .021$. No other interactions emerged, $F_s < 2.35$, $p_s > .128$.

Discussion

This study partially supported my hypotheses regarding the desirability of atheism in different mating contexts. As predicted, theistic mates were more desirable in LTM than atheists, an effect that could be rooted in perceptions of such individuals being seen as more interested monogamous reproductive strategies given the concomitant perception of them being less prone

to infidelity (Moon et al., 2018). The predicted difference between targets in conscientiousness and agreeableness further converge with these predictions, given both traits are associated with greater religiosity and interest in LTM (Schmitt & Fuller, 2015; Schmitt & Shackelford, 2008).

Unexpectedly, atheists' STM desirability compared to LTM did not translate to them being more desirable in the latter context than theists. These findings could suggest both atheists' general undesirability in monogamous pairbonds and an unwillingness for individuals to invoke the tradeoff with theistic mates entirely. Participants could have been inferring unique costs from an atheistic mate in a manner different from previous work demonstrating an STM advantage for prospective mates with a non-normative epistemology (e.g., utilitarianism; Brown & Sacco, 2019). Unlike these previous conceptualizations, this non-normativity could have been regarded as immorality that would interfere with an interest in benevolence for STM (Brown-Iannuzzi et al., 2018; Li, Bailey, Kenrick, & Linsenmeier, 2002).

Atheism could have been perceived not benefits being able to outweigh the costs in STM contexts that typically see individuals find potentially exploitative mates (e.g., individuals high in Dark Triad traits) as more desirable in the service of gaining access to a mate with good genes (see Jonason, Valentine, Li, & Harbeson, 2011). The inferences of atheists as neurotic could have undermined their attractiveness (Brown et al., in press), given that neuroticism is associated with undesirable mating behavior for both men and women (e.g., Greengross & Miller, 2008). These inferences of atheists as highly exploitative could be insufficient in heightening their desirability in STM, suggesting additional cues to heritable fitness could be necessary to deem atheists as attractive those contexts. I conducted Study 2 to identify whether individuals would be more willing to incur the perceived costs of an atheist mate in STM in the presence of additional good gene benefits.

Study 2

One possibility for individuals not upregulating their STM interest for prospective mates with an ostensibly consonant behavioral repertoire could be perceptions of such mates' potential costs as exceeding potential benefits. That is, the inferred untrustworthiness of atheism would have impeded the desirability of someone who would be more likely to engage in STM. For individuals to be willing to invoke the tradeoff in preferring atheistic mates, other potential benefits of that mate could have to be salient. The prioritization of physical attractiveness in STM could be one route through which atheists would become more desirable. Physically attractive mates are indeed more desirable in STM, with individuals nonetheless being aware of the potential costs associated with certain attractive features. For example, women's perception of muscularity as sexy in STM is paralleled with perceptions of interpersonal dominance that could present interpersonal costs in LTM domains (e.g., aggression; Frederick & Haselton, 2007; Gallup, White, & Gallup, 2007). Mating decisions are largely rooted in multimodal inferences, which warrants investigation into multiple cues (Jonason, Raulston, & Rotolo, 2012).

The purpose of this study was to determine whether individuals would be more willing to invoke the perceived tradeoffs of an atheist mate in short-term context in the presence of cues to physical attractiveness. In this pre-registered study, I presented participants with theistic and atheistic mates who varied in physical attractiveness. I predicted individuals would upregulate their interest in atheistic mates in short-term contexts when they were physically attractive. Additionally, women's considerable prioritization of physical attractiveness in STM further led me to predict this upregulation would be more apparent for women than for men (Kenrick, Trost, Groth, & Sadalla, 1993). I additionally predicted atheist targets would be perceived as more prone to infidelity much like in Study 1, although sought to consider the interactive effects of

theism with attractiveness in an exploratory analysis.

Method

Participants. I recruited a sample of 134 participants in exchange for course credit from a public university in Southeastern U.S. Two participants were excluded from final analyses for reporting no heterosexual attraction and one for not providing any responses, resulting in a final sample of $n = 131$ (74 men, 57 women; $M_{Age} = 19.50$, $SD = 1.85$; 81.7% White). I had 74% of participants identify as believing in a god, 22.1% indicating being unsure, and 3.8% not believing in a god. Like Study 1, I made no exclusions based on theistic identity.²

A sensitivity analysis indicated I was adequately powered to detect small effects using a fully within-subjects design that considered Participant Sex as a between-subjects factor (Cohen's $f = .09$, $1 - \beta = .80$). Data were collected during the last week of data collection of a semester and not analyzed until completion. Discrepancies in degrees of freedom reflect missing data from participants.

Materials and Procedures. Participants engaged in the same hypothetical dating site paradigm as Study 1 to evaluate opposite-sex targets with the same items assessing STM and LTM desirability in addition to targets' proclivity toward infidelity. This version of the study critically different from the previous by tasking participants to evaluate four targets at differing levels of attractiveness.

Targets were selected from the highly normed Chicago Faces Database (Ma, Correll, & Wittenbrink, 2015). Faces were of neutrally expressive, White young adults. I specifically selected four faces of both sexes, with two being among the most attractive and two being the least attractive. I further sought to match targets based on relative age. Preliminary comparisons of targets using the normed data indicated the attractive targets were indeed more attractive ($M =$

4.94, $SD = 0.41$) than the unattractive targets ($M = 1.79$, $SD = 0.13$), $t(6) = 14.61$, $p < .001$, $d = 10.33$. One-sample t -tests weighted against the scalar midpoint of 4 from the norming's 7-point scale, with higher scores indicating higher attractiveness, confirmed attractive targets were categorically attractive and unattractive targets categorically unattractive, $|ts| > 4.60$, $ps < .020$, $ds > 2.30$. I nonetheless included a manipulation check assessing attractiveness (1 = *Very Unattractive*; 7 = *Very Attractive*).

Accompanying each target were the same statements describing religious beliefs from Study 1. Participants evaluated two atheistic and two theistic targets, with one being attractive and the other unattractive across categories. Unique identities were counterbalanced with information about their theism and presented in a randomized order.

Results

Given the number of potentially unpredicted interactions that could emerge through a complicated statistical model, I adjusted my alpha to a more conservative $\alpha = .01$ to reduce the likelihood of reporting false positives for our three outcomes.

Attractiveness. I first conducted a 2 (Participant Sex: Male vs. Female) $\times$ 2 (Target Theism: Atheist vs. Theist) $\times$ 2 (Target Attractiveness: Attractive vs. Unattractive) mixed-model ANOVA with repeated factors over the latter two factors. A Target Attractiveness main effect indicated the attractive targets were indeed more attractive ($M = 4.22$, $SD = 1.47$) than the unattractive targets ($M = 1.72$, $SD = 1.11$), $F(1, 129) = 394.85$, $p < .001$, $\eta_p^2 = .745$. No other main effects or interactions emerged, $F_s < 3.31$, $ps > .071$.

Infidelity. I assessed targets' proclivity toward infidelity using a similarly mixed-model ANOVA as the previous analysis. A Target Theism main effect indicated the atheist targets were perceived as more prone to infidelity ($M = 3.74$, $SD = 1.56$) than the theist targets ($M = 2.55$, SD

$= 1.39$), $F(1, 128) = 41.94, p < .001, \eta_p^2 = .247$. A Target Attractiveness main effect indicated the attractive targets were perceived as more prone to infidelity ($M = 3.40, SD = 1.46$) than the unattractive targets ($M = 2.39, SD = 1.49$), $F(1, 128) = 79.40, p < .001, \eta_p^2 = .383$. A Participant Sex main effect indicated women ($M = 3.28, SD = 1.44$) perceived their respective targets as more prone to infidelity than men ($M = 2.61, SD = 1.42$), $F(1, 128) = 14.65, p < .001, \eta_p^2 = .103$.

An additional Target Theism $\times$ Target Attractiveness interaction emerged, $F(1, 128) = 8.05, p = .005, \eta_p^2 = .059$ (see Figure 2). Simple effects indicated attractive atheists were perceived as more prone to infidelity ($M = 3.87, SD = 1.54$) compared to attractive theists ($M = 2.94, SD = 1.38$), $F(1, 128) = 48.42, p < .001, \eta_p^2 = .274$. Unattractive atheists were similarly seen as more prone to infidelity ($M = 2.62, SD = 1.59$) compared to unattractive theists ($M = 2.17, SD = 1.39$), albeit at a reduced magnitude, $F(1, 128) = 9.93, p = .002, \eta_p^2 = .072$. Viewed another way, attractive theists and atheists were both perceived as more prone to infidelity than their unattractive counterparts, $F_s > 36.47, p_s < .001$, though the perception was magnitudinally larger for attractive atheists ($\eta_p^2 = .333$) than for theists ($\eta_p^2 = .222$). No other main effects or interactions reached significance at my adjusted alpha level, $F_s < 5.06, p_s > .025$.

Desirability. The primary analysis for this study was a 2 (Participant Sex: Male vs. Female) $\times$ 2 (Target Theism: Atheist vs. Theist) $\times$ 2 (Target Attractiveness: Attractive vs. Unattractive) $\times$ 2 (Mating Context: STM vs. LTM) mixed-model ANOVA with repeated factors over the latter three factors. A Target Theism main effect indicated the theist targets were more desirable ($M = 3.38, SD = 1.99$) than the atheist targets ($M = 2.79, SD = 1.64$), $F(1, 127) = 22.15, p < .001, \eta_p^2 = .149$. A Target Attractiveness main effect additionally indicated the attractive targets were more desirable ($M = 4.42, SD = 2.24$) than the unattractive targets ($M = 1.75, SD = 1.40$), $F(1, 127) = 291.81, p < .001, \eta_p^2 = .687$.

Effects were most superordinately qualified by a Target Theism $\times$ Target Attractiveness $\times$ Mating Context interaction, $F(1, 127) = 13.92, p < .001, \eta_p^2 = .099$ (see Figure 3). I decomposed this interaction by conducting two subordinate 2-way ANOVAs, separate for attractive and unattractive targets to ensure myself the opportunity to compare theists and atheists within the same comparisons. The subordinate interaction for unattractive targets was not significant, prompting no further consideration, $F(1, 129) = 0.51, p = .477, \eta_p^2 = .004$.

A subordinate Target Theism $\times$ Context interaction emerged for attractive targets, $F(1, 129) = 15.10, p < .001, \eta_p^2 = .105$. Simple effects indicated participants found attractive atheists as more desirable in STM ($M = 4.45, SD = 2.22$) than in LTM ($M = 3.69, SD = 2.16$), $F(1, 129) = 29.95, p < .001, \eta_p^2 = .188$. No difference emerged for attractive theists when comparing STM ($M = 4.73, SD = 2.26$) with LTM ($M = 4.75, SD = 2.34$), $F(1, 129) = 0.01, p = .923, \eta_p^2 < .001$. Viewed another way, no difference emerged in comparing attractive atheists with attractive theists in STM, $F(1, 129) = 1.98, p = .162, \eta_p^2 = .015$. Attractive theists were further more desirable in LTM compared to attractive atheists, $F(1, 129) = 18.07, p < .001, \eta_p^2 = .123$. No other main effects or superordinate interactions emerged at the adjusted alpha level, prompting no further consideration, $F_s < 4.10, p_s > .043$.

Discussion

Results from the current study provided mixed results for the pre-registered hypotheses, although they were consistent with Study 1. Atheistic mates were perceived as more desirable in STM compared to LTM, but only when they were attractive. This suggests participants were only interested in atheists in STM possessing cues to heritable fitness to offset the perceived costs of an atheist. Nonetheless, and contrary to predictions, this preference did not translate into participants fully invoking the tradeoff for STM. Theists were regarded as similarly desirable in

STM, suggesting participants were likely considering the costs of both types of mates.

Nonetheless, the attractive theist was most desirable in LTM. Such a finding highlights both the importance of perceived conventionality in long-term mate selection given both inferences of their disinterest in promiscuity (Brown & Sacco, 2019) and opportunities to satisfy reproductive goals related to identify good genes in addition to goals that would optimize parental investment.

Perceptions of atheists' desirability in STM over LTM were accompanied by perceptions of their proneness to infidelity, particularly among attractive targets. The perception of this proneness could be a product of dual of perceptions atheists' interest in promiscuity and recognition of attractive targets' self-perceived mate value that could facilitate successful utilization of promiscuous mating strategies (Lukaszewski & Roney, 2011; Starratt, Weekes-Shackelford, & Shackelford, 2017). Although unattractive atheists were perceived as more prone to infidelity compared to unattractive theists, the relatively low mate value the former exhibited could have shaped perceptions of promiscuity based on the degree of success in employing such mating strategies beyond mere interest in infidelity.

General Discussion

I found consistent support for a limited desirability of atheists as mates across two studies. Though more desirable in STM than LTM, an effect potentially driven by inferences of an interest in promiscuity (Moon et al., 2018), this desirability did not translate to atheists becoming more desirable in STM compared to theistic individuals. The pervasive negative attitudes toward atheism could have undermined the signal value of any potential benefits in short-term contexts that would favor mates interested in promiscuity (Gervais et al., 2017). The attribution of immortality to atheists could lead to perceptions of them being particularly harmful. Even in STM contexts that frequently see individuals become more willing to interact

with riskier mates given the short duration of the interaction (e.g., Frederick & Haselton, 2007; Jonason, Luevano, & Adams, 2012), distrust toward atheists could reduce the possibility of any benefits from being inferred. Atheism could be inferred as a specific absence of minimal benevolence required for STM (Li et al., 2002), with other non-normative behavioral repertoires that heighten STM desirability not connoting this absence. For example, utilitarians are perceived as interested in STM, but it is possible to infer their benevolence based on a desire to contribute to a greater good despite a willingness to allow harm (Brown & Sacco, 2019).

Participants downregulated the STM desirability of theists in both studies. This downregulation could be explained by recognizing the potential monogamous intent of theists that would undermine their desirability in STM necessitating selection of mates willing to dissolve the pairbond (Jonason & Buss, 2012). Theists could have been perceived as unwilling to do so, which would have muted their desirability in STM to the level of an atheist. Because of this relative equivocation between theists and atheists in STM, additional research would benefit from teasing apart the specific basis of this downregulation by tasking participants to indicate whether they perceive theists as capable of dissolving a relationship.

Both studies made predictions regarding sex differences. Women were expected to be particularly sensitive to the cost-benefit analysis of atheists, given their larger minimal reproductive costs compared to men and vulnerability to exploitation due to physical size asymmetries (Sell, Hone, & Pound, 2012; Trivers, 1972). However, data suggest men and women responded similarly to theistic and atheistic mates, which could suggest the sex-specific costs of infidelity were equally salient. Perceptions of infidelity would heighten concerns of paternal uncertainty in men and concerns of resource diversion in women that would make avoidance of mates prone to infidelity advantageous in LTM (Platek & Shackelford, 2006). The

attribution of immorality to atheists could be the basis of the observed infidelity perceptions, resulting in downregulated interest to reduce the likelihood of being exploited across contexts (Haselton & Nettle, 2006).

Judiciousness in Mate Selection

Results in the current study provided evidence for relative preferences for atheists and theists, but participants' evaluations of targets appeared based in varying degree of derogation and tolerance, given the relatively low mean desirability rating across categories. These evaluations could reflect heightened judiciousness in mate selection to reduce the likelihood of a costly mating mistake, particularly among women (Haselton & Buss, 2000). It has been suggested many preferences for cues that facilitate mating goal acquisition are better explained as bad gene aversion rather than good gene attraction (Brown, Sacco, & Medlin, 2019; Zebrowitz & Rhodes, 2004), which could have manifested in the current studies as participants' stringency in their evaluation of mates.

It could be possible the heritable fitness cues in the Chicago Faces Database were not attractive enough to invoke the tradeoff in preferring atheists in STM despite the inferred costs in Study 2. Though attractive targets' attractiveness ratings were above average, the attractiveness rating of attractive targets from Study 2 was nonetheless in a middling range unlike the normed ratings. Being in this middling range could have precluded me from identifying the proposed attractiveness advantageous, especially considering women's judiciousness in selecting short-term mates based on attractiveness (Kenrick et al., 1993; Li et al., 2013). These studies were additionally conducted during the COVID-19 pandemic, with recent findings indicating concerns of the pandemic downregulate men's interest in attractive female faces that could explain participants' downregulation of attractiveness ratings (Pazhoohi, Pazhouhi, & Kingstone, 2021).

Future studies could employ normed images further altered to amplify attractiveness, which could afford studies to consider manipulations of physically attractive facial features, including masculinized male faces and feminized females that connote developmentally appropriate levels of sex hormones (e.g., Jones et al., 2018; Smith et al., 2012) and facial symmetry that connotes immunocompetence (Thornhill & Gangestad, 2006; but see Pound et al., 2014).

Limitations and Future Directions

This program of research presents several limitations that warrant further investigation. Despite the prevalence of anti-atheist prejudice across many cultures and geographic regions (Gervais et al., 2017), it could be possible this particular aversion to atheists is specific to the fact that these data were collected in the Southeastern U.S., a region typically regarded as the “Bible Belt” that could possess a greater aversiveness of atheists compared to other regions due to a culture that seeks to maintain normativity through honor (Cohen & Nisbett, 1997). Future research would benefit from replication efforts in regions with greater presence of secularity. While considering a greater presence of atheists, it could additionally prove advantageous to identify whether an overall presence of atheists in a region could reduce an aversion to atheist mates (Gervais, 2011). Another advantage afforded by investigating perceptions in different regions could be an opportunity to consider differences between atheist and theist responses in adequately powered comparisons.

Another limitation was the conceptualization of atheism as a simple binary of (dis)belief without addressing the potential bases for targets’ atheism or theism. Future work would benefit from identifying whether various categories of atheists (e.g., inCREDulous atheism, apatheism) have different values across mating contexts (Norenzayan & Gervais, 2013). For example, individuals classified as exhibiting apatheism are unmotivated to engage religion and could

potentially oppose its practice; this atheism could be perceived as intentional undermining of social rules and could be deemed particularly undesirable in mating contexts. Conversely, inCREDulous atheists are merely indifferent, a lack of religiosity that could be more tolerable. Future work may also consider different displays of religiosity, particularly intrinsic versus extrinsic. Intrinsic religiosity refers to beliefs that are an end in themselves, whereas extrinsic refers to beliefs driven by external factors that are typically regarded as socially desirable responding (e.g., Allport & Ross, 1967; Sedikides & Gebauer, 2010). Such socially desirable responding could be indicative of a personality associated with promiscuous mating strategies (e.g., mate poaching), making it sensible to predict intrinsic religiosity would be more desirable in LTM (Jonason, Li, & Buss, 2010; Paulhus, 1998).

It is important to clarify that these perceptions of infidelity and subsequent desirability ratings appear based largely on stereotypes of atheists and theists and may not reflect accurate inferences of their preferred reproductive strategies. Future studies could task atheists and theists with providing information regarding their preferred reproductive strategy from which perceivers could infer their interests. Individuals' interest in promiscuous (versus monogamous) mating strategies can be accurately inferred through physical appearance (Antar & Stephen, in press; Boothroyd, Jones, Burt, DeBruine, & Perrett, 2008), which could potentially correlate with accurate perceptions of religiosity due to its association with sexual restrictedness (Schmitt & Fuller, 2015). Participants could evaluate the STM and LTM desirability of espoused atheists and theists that could be correlated with the targets' preferred mating strategies.

A potential caveat is my focus on ideal preferences rather than actual choices (Eastwick & Finkel, 2008). Although mate preferences reflect actual mate choice (Li et al., 2013), future studies would benefit from specifically employing paradigms that necessitate participants make

actual mating decisions to invoke the proposed tradeoff. Speed dating with prospective mates indicating their religious orientation could afford the opportunity to track participants' decision to pursue such mates (Finkel & Eastwick, 2008). The utilization of ipsative scales, with participants selecting an actual mate rather than rating the degree of interest in pursuit, would further be crucial in future studies (e.g., Jonason et al., 2012). Previous work has successfully employed such scales in assessing perceptions of atheists' social affordances that it could be advantageous to consider in mating paradigms (Moon et al., in press).

Conclusion

Pervasive anti-atheist prejudice appears to have downstream consequences for identifying atheists as potential mates. This program of research found evidence for this aversion in favor of mates espousing a religious identity, particularly in long-term contexts. Taken together, results highlight how individuals value perceived costs and benefits of mates whose beliefs they infer as capable of undermining relational formation.

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Notes

¹When excluding agnostic and atheistic participants, results largely stayed the same, though the non-significant simple effect comparison between the atheist and theist for STM became significant demonstrating the atheist was more desirable in STM than in LTM.

²Excluding non-theistic participants made two superordinate omnibus interactions conventionally significant that were not significant when including the full sample, suggesting those significant findings could be rooted in a limited sample being underpowered. The critical omnibus interaction did not meaningfully change with exclusions.

Table 1. Mean (and standard deviation) ratings of perceived trait exhibition of theistic and atheistic targets

	Theist	Atheist	<i>t</i>	<i>d</i>
Extraversion	3.66 (1.12)	3.84 (1.37)	-0.89	-0.08
Agreeableness	4.10 (1.21)	3.48 (1.14)	3.41*	0.33
Conscientiousness	4.72 (1.09)	3.76 (1.12)	5.76**	0.56
Neuroticism	3.78 (1.03)	4.37 (1.07)	-3.85**	-0.37
Openness	4.05 (1.04)	3.98 (1.08)	0.49	0.05
Infidelity	2.65 (1.30)	3.92 (1.43)	-6.37**	-0.62

Note. * $p < .010$, ** $p < .001$

Figure 1. Contextual desirability of theist and atheists for Study 1 (with standard error bars).

Figure 2. Perceived infidelity proclivity for attractive and unattractive atheists and theists for Study 2 (with standard error bars).

Figure 3. Desirability for attractive (a) and unattractive targets (b) as a function of theism in long-term (LTM) and short-term mating (STM) domains for Study 2 (with standard error bars).