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NASA faked the moon landing—Therefore (Climate) Science is a Hoax: An Anatomy of the Motivated Rejection of Science

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Abstract

Although nearly all domain experts agree that human CO_2 emissions are altering the world's climate, segments of the public remain unconvinced by the scientific evidence. Internet blogs have become a vocal platform for climate denial, and bloggers have taken a prominent and influential role in questioning climate science. We report a survey (N $>$ 1100) of climate blog users to identify the variables underlying acceptance and rejection of climate science. Paralleling previous work, we find that endorsement of a laissez-faire conception of free-market economics predicts rejection of climate science ($r \simeq .80$ between latent constructs). Endorsement of the free market also predicted the rejection of other established scientific findings, such as the facts that HIV causes AIDS and that smoking causes lung cancer. We additionally show that endorsement of a cluster of conspiracy theories (e.g., that the CIA killed Martin-Luther King or that NASA faked the moon landing) predicts rejection of climate science as well as the rejection of other scientific findings, above and beyond endorsement of laissez-faire free markets. This provides empirical confirmation of previous suggestions that conspiracist ideation contributes to the rejection of science. Acceptance of science, by contrast, was strongly associated with the perception of a consensus among scientists.

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More than 90% of climate scientists agree that the global climate is changing largely due to human CO_2 emissions (Anderegg, Prall, Harold, & Schneider, 2010; Doran & Zimmerman, 2009).[1] There are indications that the 2007 assessment of the Intergovernmental Panel on Climate Change (IPCC) was conservative rather than "alarmist" (Allison et al., 2009; Freudenburg & Muselli, 2010); however, those scientific indicators of increasing actual risk are accompanied by an apparent decrease in the public's perception of those risks in some countries (Brulle, Carmichael, & Jenkins, 2012; Hanson, 2009; Scruggs & Benegal, 2012).

The reasons for this declining public concern are manifold. Researchers in history and sociology frequently cite the "manufacture of doubt" by vested interests and political groups as a factor (Jacques, Dunlap, & Freeman, 2008; McCright & Dunlap, 2003, 2010; Mooney, 2007; Oreskes & Conway, 2010; Stocking & Holstein, 2009). For example, over 90% of environmentally sceptical books published since 1972 have been demonstrably sponsored by conservative think tanks (Jacques et al., 2008). Oreskes and Conway (2010) analyzed the shared ideological underpinnings of organized attempts to question well-established scientific findings over the last few decades, from the link between smoking and lung cancer to the causal role of chlorofluorocarbons (CFC's) in eroding the ozone layer to, most recently, the findings from climate science. Oreskes and Conway documented that a small number of organizations and individuals have been instrumental in those contrarian activities, arguably motivated by a laissez-faire free-market ideology that views as threatening any scientific finding with potential regulatory impact, such as

interference with the marketing of tobacco products, bans on CFC's, or a price on carbon (cf. Dunlap & McCright, 2011).

Those historical analyses mesh well with empirical results which show that people's rejection of climate science is associated with the embrace of laissez-faire free-market economics (Heath & Gifford, 2006; Kahan, 2010). There is little doubt that people's personal ideology—also often referred to as worldview or cultural cognition—is a major predictor of the rejection of climate science (Dunlap & McCright, 2008; Hamilton, 2011; Heath & Gifford, 2006; Feygina, Jost, & Goldsmith, 2010; Kahan, 2010; Kahan, Jenkins-Smith, & Braman, 2011; McCright & Dunlap, 2011a, 2011b). In this article we investigate predictors of the rejection of climate science and investigate whether they generalize across content domains. We define the rejection of science as the dismissal of well-established scientific results for reasons that are not scientifically grounded (Diethelm & McKee, 2009; Jacques, 2012; McKee & Diethelm, 2010).[2] Those reasons may comprise the psychological factors that are of interest here, but they may also include indecision arising from inaccurate or misleading media coverage—for example, the scientific consensus on climate change is often misrepresented in the media (e.g., Boykoff, 2007). Rejection of science must be distinguished from true scepticism, which may prompt the revision of a scientific claim on the basis of evidence and reasoned theorizing. Skepticism is not only at the core of scientific reasoning but has also been shown to improve people's discrimination between true and false information (e.g., Lewandowsky, Stritzke, Oberauer, & Morales, 2005, 2009).

Another variable that has been associated with the rejection of science is conspiratorial thinking, or conspiracist ideation, defined here as the attempt to explain a significant political or social event as a secret plot by powerful individuals or organizations (Sunstein & Vermeule, 2009). The presumed conspirators are typically perceived as virtually omnipotent (Bale, 2007): thus, internal documents of the tobacco industry

referred to medical research on the health effects of smoking as "a vertically integrated, highly concentrated, oligopolistic cartel" which in combination with "public monopolies" . . . "manufactures alleged evidence, suggestive inferences linking smoking to various diseases, and publicity and dissemination and advertising of these so-called findings" (Abt, 1983). Likewise, rejection of the link between HIV and AIDS has been publicly associated with the conspiratorial belief that HIV was created by the U.S. Government to wipe out Black people (e.g., Bogart & Thorburn, 2005; Kalichman, Eaton, & Cherry, 2010). Rejection of climate science has also long been infused with notions of a conspiracy among scientists. As early as 1996, accusations of corruption in the IPCC were aired in the *Wall Street Journal* (Lahsen, 1999; Oreskes & Conway, 2010). More recently, a book by a U.S. Senator referred to a "Global Warming Conspiracy" as "The Greatest Hoax" (Inhofe, 2012).

The prominence of conspiracist ideation in science denial is not entirely surprising because if an overwhelming scientific consensus cannot be accepted as the result of researchers independently converging on the same evidence-based view, then its very existence calls for an alternative explanation—a function readily fulfilled by the ideation of a complex and secretive conspiracy among researchers (Diethelm & McKee, 2009; McKee & Diethelm, 2010). However, no empirical evidence exists about how widespread such ideations are among people who reject scientific evidence, in particular as it relates to climate change. Moreover, to date, analyses of conspiracist ideation in the rejection of science have exclusively focused on conspiracy theories pertaining to the issue under consideration: Thus, AIDS denial has been linked to the belief that the U.S. Government created HIV; the tobacco industry viewed lung cancer research as an "oligopolistic cartel," and climate deniers believe that temperature records have been illegitimately adjusted to exaggerate warming (e.g., Condon, 2009). In all those cases, the conspiracy theory serves to explain away overwhelming scientific evidence. Thus, the conspiracist ideation may be

an accoutrement of the denial of an inconvenient scientific fact, rather than reflecting an independent and potentially stable psychological variable that is associated with the rejection of science more generally.

It is known that people's propensity for conspiracist ideation is not limited to one theory in isolation. Instead, the belief that AIDS was created by the government is likely accompanied by the conviction that the FBI killed Martin Luther King or that the Air Force is hiding evidence of extraterrestrial visitors (Goertzel, 1994; Swami, Chamorro-Premuzic, & Furnham, 2009). In support of a general disposition towards conspiracist ideation, Douglas and Sutton (2011) showed that endorsement of conspiracy theories was associated with people's willingness to engage in a conspiracy themselves when deemed necessary. It is therefore possible that this disposition predicts the rejection of science independently of the scientific domain in question: if conspiracist ideation reflects a stable personality or cognitive characteristic, then beliefs such as that NASA faked the moon landing may predict rejection of a range of scientific propositions, from HIV/AIDS to climate change.

Another common attribute of the contemporary rejection of science is its reliance on the internet (Diethelm & McKee, 2009; McKee & Diethelm, 2010). By definition, denial is difficult to practice in the peer-reviewed literature; for example, questioning the link between HIV and AIDS lost intellectual respectability decades ago (Nattrass, 2010, 2011), and there are few contrarian climate publications (Anderegg et al., 2010). The internet, by contrast, provides opportunity for individuals who reject a scientific consensus to feed "each other's feelings of persecution by a corrupt elite" (McKee & Diethelm, 2010, pp. 1310–1311). Accordingly, climate "skeptic" blogs have become a major staging post for denial, although blogs are also used to disseminate scientific evidence by supporters of climate science. The influence of blogs should not be underestimated: One "skeptic" blogger (Steven McIntyre of "Climateaudit") has testified before the U.K. Parliament

after triggering several Congressional investigations; one anonymous pro-science blogger ("Deep Climate") uncovered a plagiarism scandal involving a "skeptic" report for Congress, which ultimately led to the retraction of a peer-reviewed paper. Popular climate blogs can register upward of 700,000 monthly visitors; a self-selected audience that is by definition highly engaged in the increasingly polarized climate debate.

Climate blog denizens therefore present a highly relevant population for the study of variables underlying endorsement or rejection of the scientific consensus on climate. We surveyed blog denizens on (a) their views on climate science and a range of other scientific propositions; (b) two constructs that we hypothesized to be associated with rejection of science (free-market ideology and a range of conspiracy theories); (c) a construct targeting people's sensitivity to environmental problems (e.g., whether previous concerns about acid rain have been addressed); (d) and the perceived consensus among scientists, which has been repeatedly linked to acceptance of science (Ding, Maibach, Zhao, Roser-Renouf, & Leiserowitz, 2011; Dunlap & McCright, 2008; Kahan et al., 2011; Lewandowsky, Gignac, & Vaughan, 2012).

Method

Participants

Visitors to climate blogs voluntarily completed an online questionnaire between August and October 2010 ($N = 1377$). Links were posted on 8 blogs (with a pro-science science stance but with a diverse audience); a further 5 "skeptic" (or "skeptic"-leaning) blogs were approached but none posted the link.

Questionnaire

Table 2 lists items retained for analysis together with their abbreviated variable names.[3] The free-market items were taken from Heath and Gifford (2006). Most of the

conspiracy items were adapted from previous research (e.g., Swami et al., 2009). Conspiracies covered the political spectrum, with fears of the "World Government" being most pronounced on the political right, and the "9-11 was an inside job" theory being prevalent on the left (Nyhan, 2010). The remaining items were designed for this study.

Results

Following standard recommendations (Gosling, Vazire, Srivastava, & John, 2004), duplicate responses from any IP number were eliminated ($N = 71$). An additional 161 responses were eliminated because the respondent's age was implausible (< 10 or > 95) or values for the consensus items were outside the $0 - 100$ range, or because responses were incomplete. This left 1145 complete records for analysis. Items were reverse-scored where necessary, such that larger scores pointed to greater endorsement of the underlying construct. Raw correlation matrices and summary statistics are reported in the online supplemental material.

Analyses focused on the relation among constructs of greatest interest: Free-market ideology, acceptance of climate science and of other sciences, perceived consensus among scientists, conspiracist ideation, and the belief that earlier environmental problems have been resolved. The over-arching analysis involved structural-equation modeling (SEM), with the data preprocessed as follows.

Separate exploratory factor analyses were conducted for the free market, climate-change, and conspiracist ideation items. For free-market items, a single factor comprising 5 items (all but *FMNotEnvQual*) accounted for 56.5% of the variance; the remaining item loaded on a second factor (17.7% variance) by itself and was therefore eliminated. The 5 climate change items (including *CauseCO2*) loaded on a common factor that explained 86% of the variance; all were retained. For conspiracist ideation, two factors were identified that accounted for 42.0 and 9.6% of the variance, respectively, with

the items involving space aliens (*CYArea51* and *CYRoswell*) loading on the second factor and the remaining 10 on the first one (*CYAIDS* and *CYClimChange* were not considered for the reasons stated in Table 2). Items loading on each factor were summed to form two composite manifest variables. The two composites thus estimate a conspiracist construct without any conceptual relation to the scientific issues under investigation.

Acceptance of science and consensus

The acceptance-consensus item pairs (e.g., *CauseHIV* – *ConsensHIV*) were entered into an SEM with two correlated latent variables, one capturing the common variance of all "belief" questions, and the other representing all "consensus" questions (see Figure 1). Pairwise correlations between the residuals for each belief-consensus pair represented content-specific covariance. All SEM's were performed with M-PLUS using ordinal coding of the manifest variables, with the consensus responses binned into 9 categories with approximately equal numbers.

The model fit reasonably well, $\chi^2(5) = 53.71$, $p < .0001$, CFI= .989, RMSEA= .092 (90% CI: .071 – .115). People's content-general inclination to accept science was associated with content-general perceived scientific consensus; $r = .43$, $Z = 12.76$, $p < .0001$, over and above the content-specific links represented by the pairwise correlations. The fact that acceptance of climate science (*CauseCO2*) and perceived consensus among climate scientists (*ConsensCO2*) loaded onto their respective latent variables together with other very different scientific propositions suggests that respondents did not gauge consensus among climate scientists, and evaluate climate science, independently of their views of other, unrelated domains of scientific inquiry. Rather, their perception of consensus and their endorsement of scientific findings about the climate reflected in part a content-independent disposition to perceive scientific consensus, and a correlated

disposition to accept scientifically well-established propositions. This finding replicated the factor structure reported by Lewandowsky et al. (2012).

Ideology, conspiratorial thinking, and acceptance of science

We next examined the interplay between the 5 constructs of greatest interest: Acceptance of climate science, acceptance of other scientific propositions, free-market ideology, the belief that previous environmental problems have been resolved, and conspiracist ideation. For this analysis, climate science was considered separately from the other scientific propositions.

An exploratory model that estimated correlations among all 5 latent variables fit well, $\chi^2(78) = 261.0$, $p < .0001$, CFI= .997, RMSEA= .045 (90% CI: .039 – .051), with the pairwise correlations between the latent variables given in Table 1. Manifest variables and latent variable names are provided in Table 2.

We next sought to predict acceptance of climate science and other sciences from the remaining three latent variables while simultaneously simplifying the model by removing non-significant correlations and regression weights. This final model fit very well, $\chi^2(82) = 182.1$, $p < .0001$, CFI= .999, RMSEA= .033 (90% CI: .026 – .039) and its fit did not differ from that of the unconstrained model that included all correlations, $\Delta\,\chi^2(4) = 3.525$, $p > .10$. Figure 2 shows the model at the level of latent variables, displaying only weights and correlations that were statistically significant ($p < .05$).

Several aspects of the model are noteworthy: First, endorsement of free markets was highly predictive of rejection of climate science ($\beta = -.77$). Second, free-market ideology also predicted the rejection of other scientific propositions, although the magnitude of that correlation was smaller ($\beta = -.49$). Third, conspiracist ideation was negatively associated with acceptance of climate science and other scientific propositions; $\beta = -.21$ and $\beta = -.55$, respectively. Finally, the perception that previous environmental problems have

been solved was negatively associated with climate science ($\beta = -.20$) but was unrelated to other sciences (β set to 0).

The three latent predictors accounted for the lion's share of variance in acceptance of climate science and for about half the variance in the acceptance of other sciences. Notably, the three predictors explained the entire association between the two latent criterion variables (initially $r = .563$; see Table 1), because there was no remaining unexplained correlation (with r between the residuals of climate science and other sciences set to 0 without loss of fit). Similarly, conspiracist ideation did not correlate with the other two predictors.

Discussion

Summary of results

Rejection of climate science was strongly associated with endorsement of a laissez-faire view of unregulated free markets. This replicates previous work (e.g., Heath & Gifford, 2006) although the strength of association found here ($r \simeq .80$) exceeds that reported in any extant study. At least in part, this may reflect the use of SEM, which enables measurement of the associations between constructs free of measurement error (Fan, 2003).

A second variable that was associated with rejection of climate science as well as other scientific propositions was conspiracist ideation. Notably, this relationship emerged even though conspiracies that related to the queried scientific propositions (AIDS, climate change) did not contribute to the conspiracist construct. By implication, the role of conspiracist ideation in the rejection of science did not simply reflect "convenience" theories that provided specific alternative "explanations" for a scientific consensus. Instead, this finding suggests that a general propensity to endorse any of a number of conspiracy theories predisposes people to reject entirely unrelated scientific facts.

The relative importance of those two constructs differed between climate science and the other scientific propositions. We suggest that free-market ideology was more important for climate science than conspiratorial thinking ($\beta = -.77$ vs. $\beta = -.21$) for two reasons: First, climate science has arguably become more politicized than other sciences (Hamilton, 2011; McCright & Dunlap, 2011a), and second, given the fundamental importance of fossil fuels (and hence CO_2 emissions) to contemporary economies, climate science presents a far greater threat to laissez-faire economics than the medical facts that HIV causes AIDS and that smoking causes lung cancer. Conversely, for the same reasons but in reverse, conspiracist ideation was relatively more important for AIDS and lung cancer ($\beta = -.55$) than free-market ideology ($\beta = -.49$).

The third construct, the perception that previous environmental problems have been solved, turned out to predict rejection of climate science, but not of the other sciences. We suggest that this construct reflects a predisposition to dismiss environmental concerns (or consider them solved) that is prevalent in particular among adherents of the free market (as evidenced by the weight with free-market ideology; $\beta = .50$).

Finally, we replicated the finding that perceived scientific consensus is associated with acceptance of science (Ding et al., 2011; Dunlap & McCright, 2008; Kahan et al., 2011; Lewandowsky et al., 2012). Although the direction of causality cannot be ascertained from these data, it has been shown that providing consensus information can significantly enhance people's acceptance of climate science (Lewandowsky et al., 2012).

Potential objections

Our respondents were self-selected denizens of climate blogs. One potential objection against our results might therefore cite the selected nature of our sample. We acknowledge that our sample is self-selected and that the results may therefore not generalize to the population at large. However, this has no bearing on the importance of

our results—we designed the study to investigate what motivates the rejection of science in individuals who choose to get involved in the ongoing debate about one scientific topic, climate change. As noted at the outset, this group of people has demonstrable impact on society and understanding their motivations and reasoning is therefore of considerable importance.

Another objection might raise the possibility that our respondents willfully accentuated their replies in order to subvert our presumed intentions. As in most behavioral research, this possibility cannot be ruled out. However, unless a substantial subset of the more than 1,000 respondents conspired to coordinate their responses, any individual accentuation or provocation would only have injected more noise into our data. This seems unlikely because subsets of our items have been used in previous laboratory research, and for those subsets, our data did not differ in a meaningful way from published precedent. For example, the online supplemental material shows that responses to the Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) replicated previous research involving the population at large, and the model in Figure 1 exactly replicated the factor structure reported by Lewandowsky et al. (2012) using a sample of pedestrians in a large city.

A final concern might be that respondents who rejected science did so on the basis of a general critical stance or predisposition to reject *any* proposition put before them for potential endorsement. We find this highly unlikely because respondents who rejected scientific propositions were quite likely to endorse other items, such as various conspiracy theories or the idea that "an economic system based on free markets unrestrained by government interference automatically works best to meet human needs" (*FMUnresBest* in Table 2).

Theoretical implications

The pivotal role of personal ideology in the rejection of climate science has been repeatedly demonstrated (Dunlap & McCright, 2008; Hamilton, 2011; Heath & Gifford, 2006; Feygina et al., 2010; Kahan, 2010; Kahan et al., 2011; McCright & Dunlap, 2011a, 2011b). We highlighted the magnitude of this effect among blog denizens, people with a strong interest in the issue, and we additionally showed that endorsement of the free market also predicted the rejection of two other well-established scientific facts. This novel result is particularly intriguing because only one of those facts, the link between tobacco smoke and lung cancer, has regulatory implications and has a history of organized ideologically-motivated denial (e.g., Michaels & Monforton, 2005; Oreskes & Conway, 2010). The fact that HIV causes AIDS, by contrast, seems of little relevance to one's views on the free market at first glance. However, the association between ideology and rejection of the HIV/AIDS link meshes well with out finding that perceived consensus and acceptance of science were associated via general factors that transcended pairwise correlations (Figure 1). If acceptance of science is a coherent construct, then it is not altogether surprising that rejection of established facts is also consistently associated with free-market ideology and conspiracist ideation.

Our results identify conspiracist ideation as a personality factor or cognitive style, with numerous theories being captured by a single latent construct (cf. Goertzel, 1994; Swami et al., 2009, 2011). The negative association between conspiracist ideation and acceptance of well-established science confirms previous conceptual analyses (Diethelm & McKee, 2009; Goertzel, 2010; McKee & Diethelm, 2010). However, to our knowledge, our results are the first to provide empirical evidence for the correlation between a general construct of conspiracist ideation and the general tendency to reject well-founded science. This association is particularly notable because it persisted after "convenience-theories" were removed, thus reliably linking broad-based rejection of science to ideations that

appear quite unrelated at first glance, such as the notion that the U.S. government had advance knowledge about the 9-11 attacks or that the FBI assassinated Martin Luther King.

We suggest that the study and analysis of conspiracist ideation is of increasing importance: First, the spread of conspiracy theories about the alleged risks from vaccinations has been linked to reduced vaccination rates with consequent adverse public-health impacts (Goertzel, 2010). In the climate arena, the conspiracist ideation that all of the world's scientific academies have conspired together to create a "hoax" known as global warming has demonstrably found traction in American mainstream politics (Inhofe, 2012). Second, there is evidence that conspiracy theories are capable of influencing people even when they explicitly attempt to discount them. Douglas and Sutton (2008)showed that after exposure to conspiracy theories about the death of Princess Diana, participants were demonstrably affected by those theories even when seeking to dismiss their influence. Third, belief in conspiracy theories appears to be inducable. Swami et al. (2011) was able to induce belief in an entirely fictitious conspiracy theory involving a popular soft drink (e.g., that the drink "raises dopamine levels"), especially among participants who already held other conspiratorial views. Swami et al.'s study is arguably a laboratory equivalent of the real-life "experiment" conducted by vested interests and political groups with respect to climate science (cf. Oreskes & Conway, 2010).

In closing, we consider briefly what "counter-measures" might be available to reduce the influence and spread of conspiracy theories. Conspiracist ideation is, by definition, difficult to correct because any evidence contrary to the conspiracy is itself considered evidence of its existence (Bale, 2007; Sunstein & Vermeule, 2009). Thus, increasing global temperatures are reinterpreted as being the result of "government agencies" selectively removing thermometers that show a cooling trend and retaining only those that show the "desired" warming trend.

Sunstein and Vermeule (2009) discussed several potential counter-measures that are at the disposal of government officials, several of which mesh well with our finding. For example, Sunstein and Vermeule suggested that instead of rebutting single conspiracy theories, efforts should be made to rebut many at the same time—this meshes with our finding that conspiracist ideation tends to be quite broad. Multiple rebuttals also raise the complexity of possible conspiracist responses (not only must there be a conspiracy to remove thermometers, but there must also be a conspiracy to launch a false "decoy" theory about the absence of a plane hitting the Pentagon on 9/11 in order to detract from the real conspiracy, which was to destroy the Twin Towers, and so on.) Sunstein and Vermeule (2009) note the possibility of addressing the "demand" rather than "supply" of conspiracy theories; that is, rather than change the mind of actual believers, communication should be directed at potential consumers of theories to inoculate them against accepting such theories.

Similarly, Lewandowsky, Ecker, Farrell, and Brown (in press) offer a broad review of "debiasing" techniques that are directly applicable to the rebuttal of conspiracy theories and include suggestions about how to avoid various "backfire" effects that can arise when people's worldviews are challenged by the corrective information. Some of those suggestions, such as re-affirmation of a subset of beliefs among recipients of conspiracy theories, were echoed by Sunstein and Vermeule (2009).

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Footnotes

[1] The existence of a scientific consensus about core principles of climate change does not imply absence of uncertainty or the absence of legitimate scientific debate surrounding as yet unresolved issues. The core aspects of climate science on which there is a strong consensus are that the climate is changing, that greenhouse gases are responsible, and that we are beginning to witness predicted changes in climate patterns (Somerville, 2011).

[2] We prefer "rejection of science" to the term "denial," which in current scholarly usage pertains to an active public denial of scientific facts by various means, such as the use of rhetoric to create the appearance of debate where there is none (Diethelm & McKee, 2009; Jacques, 2012; McKee & Diethelm, 2010). Thus, whereas investigations of denial focus on the techniques by which organizations or individuals seek to undermine scientific findings in the public's eye, our research on the rejection of science focuses on the factors that predispose people to be susceptible to organized denial. We thus use "denial" to refer to public activities connected to the rejection of science, and use "rejection" when talking about individuals' attitudes towards science.

[3] The survey included several additional items (e.g., querying perceived income rank), none of which were relevant to the constructs of interest. The complete data are available upon request.

Table 1

Pairwise correlations between latent variables in an unconstrained model that included 5 latent variables.

Variable	Climate science	Other sciences	Problems solved	Free market
Climate science	—			
Other sciences	.563	—		
Problems solved	−.586	−.263	—	
Free market	−.866	−.464	.498	—
Conspiracist ideation	−.197	−.538	.032	.021

Table 2

Questionnaire items and variable names

Variable name	Item (R = reverse scored)	Loading[1]
	Free market[2]	
FMUnresBest	An economic system based on free markets unrestrained by government interference automatically works best to meet human needs.	.802
FMNotEnvQual	I support the free market system but not at the expense of the environmental quality. (R)	(omitted)
FMLimitSocial	The free market system may be efficient for resource allocation but it is limited in its capacity to promote social justice. (R)	.624
FMMoreImp	The preservation of the free market system is more important than localized environmental concerns.	.827
FMThreatEnv	Free and unregulated markets pose important threats to sustainable development. (R)	.887
FMUnsustain	The free market system is likely to promote unsustainable consumption. (R)	.892

[1] Standardized regression weights of manifest variables on their corresponding latent variable in Figure 2. All weights are significant.

[2] Unless otherwise noted, all items used a 4-point scale ranging from "Strongly Disagree' (1) to "Strongly Agree" (4). Table section headings correspond to latent variable names in Figure 2.

Climate science		
CO2TempUp	I believe that burning fossil fuels increases atmospheric temperature to some measurable degree.	.941
CO2AtmosUp	I believe that the burning of fossil fuels on the scale observed over the last 50 years has increased atmospheric temperature to an appreciable degree.	.969
CO2WillNegChange	I believe that the burning of fossil fuels on the scale observed over the last 50 years will cause serious negative changes to the planet's climate unless there is a substantial switch to non CO2 emitting energy sources.	.982
CO2HasNegChange	I believe that the burning of fossil fuels on the scale observed over the last 50 years has caused serious negative changes to the planet's climate.	.921

Problems solved		
CFCNowOK	The problem of chlorofluorocarbons (CFCs) is no longer a serious threat to the ozone layer.	.801
AcidRainNowOK	The problem of acid rain is no longer a serious threat to the global ecosystem.	.927

Conspiracist ideation		
CYNewWorldOrder	A powerful and secretive group known as the New World Order are planning to eventually rule the world through an autonomous world government which would replace sovereign governments.	.742[3]
CYSARS	SARS (Severe Acute Respiratory Syndrome) was produced under laboratory conditions as a biological weapon.	.742
CYPearlHarbor	The U.S. government had foreknowledge about the Japanese attack on Pearl Harbor but allowed the attack to take place so as to be able to enter the Second World War.	.742
CYMLK	The assassination of Martin Luther King Jr. was the result of an organized conspiracy by U.S. government agencies such as the CIA and FBI.	.742
CYMoon	The Apollo moon landings never happened and were staged in a Hollywood film studio.	.742
CYJFK	The assassination of John F. Kennedy was not committed by the lone gunman Lee Harvey Oswald but was rather a detailed organized conspiracy to kill the President.	.742

[3] Same loading is shown for all items that entered into composite manifest variable.

CY911	The U.S. government allowed the 9-11 attacks to take place so that it would have an excuse to achieve foreign (e.g., wars in Afghanistan and Iraq) and domestic (e.g., attacks on civil liberties) goals that had been determined prior to the attacks.	.742
CYDiana	Princess Diana's death was not an accident but rather an organised assassination by members of the British royal family who disliked her.	.742
CYOkla	The Oklahoma City bombers Timothy McVeigh and Terry Nichols did not act alone but rather received assistance from neo-Nazi groups.	.742
CYCoke	The Coca Cola company intentionally changed to an inferior formula with the intent of driving up demand for their classic product later reintroducing it for their financial gain.	.742
CYRoswell	In July 1947 the U.S. military recovered the wreckage of an alien craft from Roswell, New Mexico, and covered up the fact.	.891
CYArea51	Area 51 in Nevada is a secretive military base that contains hidden alien spacecraft and or alien bodies.	.891
CYClimChange	The claim that the climate is changing due to emissions from fossil fuels is a hoax perpetrated by corrupt scientists who wish to spend more taxpayer money on climate research.[4]	

[4] This item was not entered as manifest variables to estimate the conspiracist ideation latent variable because it referred to a conspiracy relevant to the scientific proposition being

CYAIDS	U.S. agencies intentionally created the AIDS epidemic and administered it to Black and gay men in the 1970s.[5]	
	Other sciences	
CauseHIV	The HIV virus causes AIDS.	.894
CauseSmoke	Smoking causes lung cancer.	.845
	Consensus items [6]	
ConsensHIV	Out of 100 medical scientists how many do you think believe that the HIV virus causes AIDS.	
ConsensSmoke	Out of 100 medical scientists how many do you think believe that smoking causes lung cancer.	
ConsensCO2	Out of 100 climate scientists how many do you think believe that human CO_2 emissions cause climate change.	

queried. People might therefore endorse this item because it represents a convenient way to justify a rejection of climate science actually motivated by other variables.

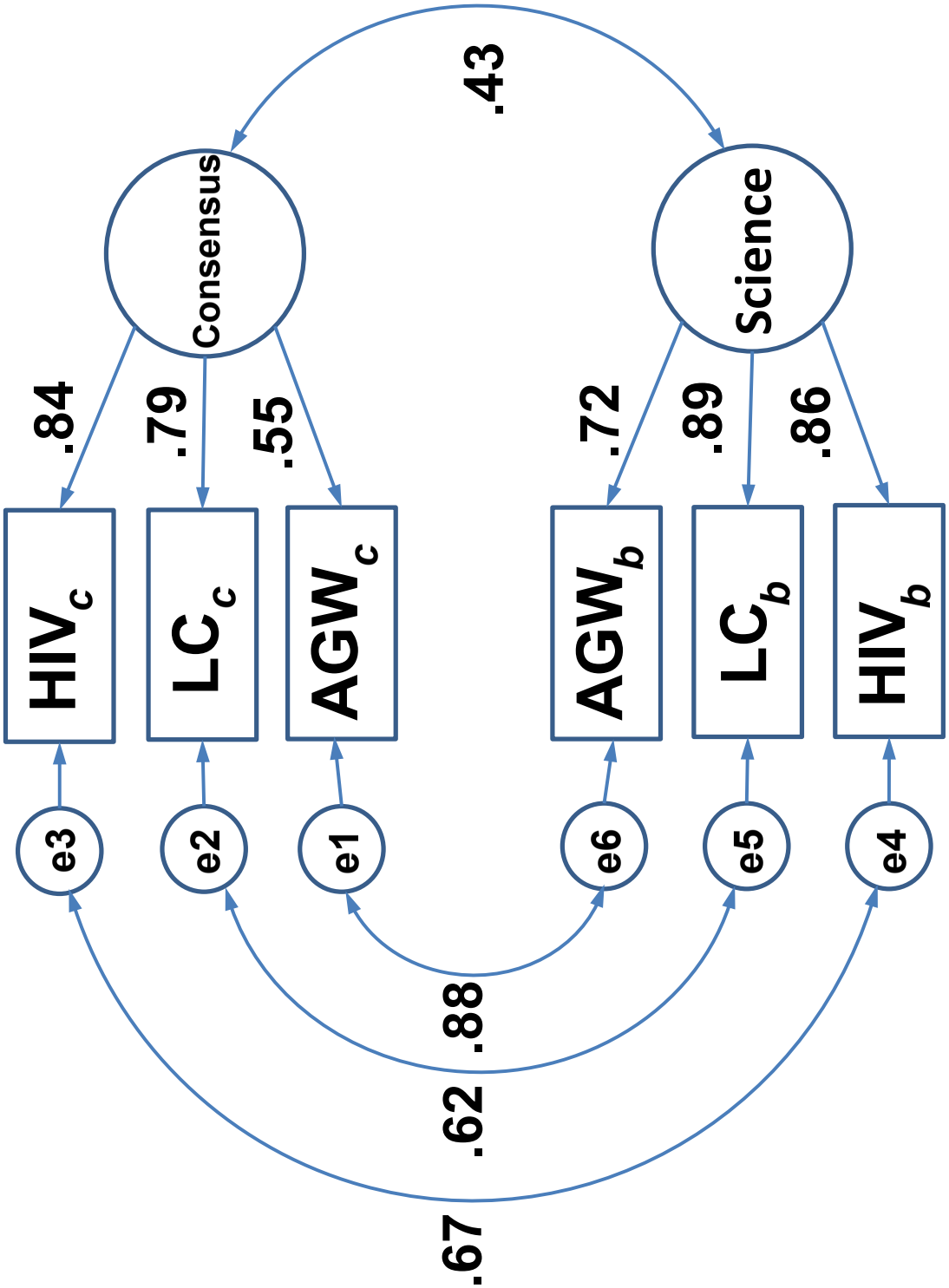
[5] This item was not entered as manifest variables to estimate the conspiracist ideation latent variable because they referred to a conspiracy relevant to the scientific proposition being queried. People might therefore endorse this item because it represents a convenient way to justify a rejection of the HIV–AIDS link actually motivated by other variables.

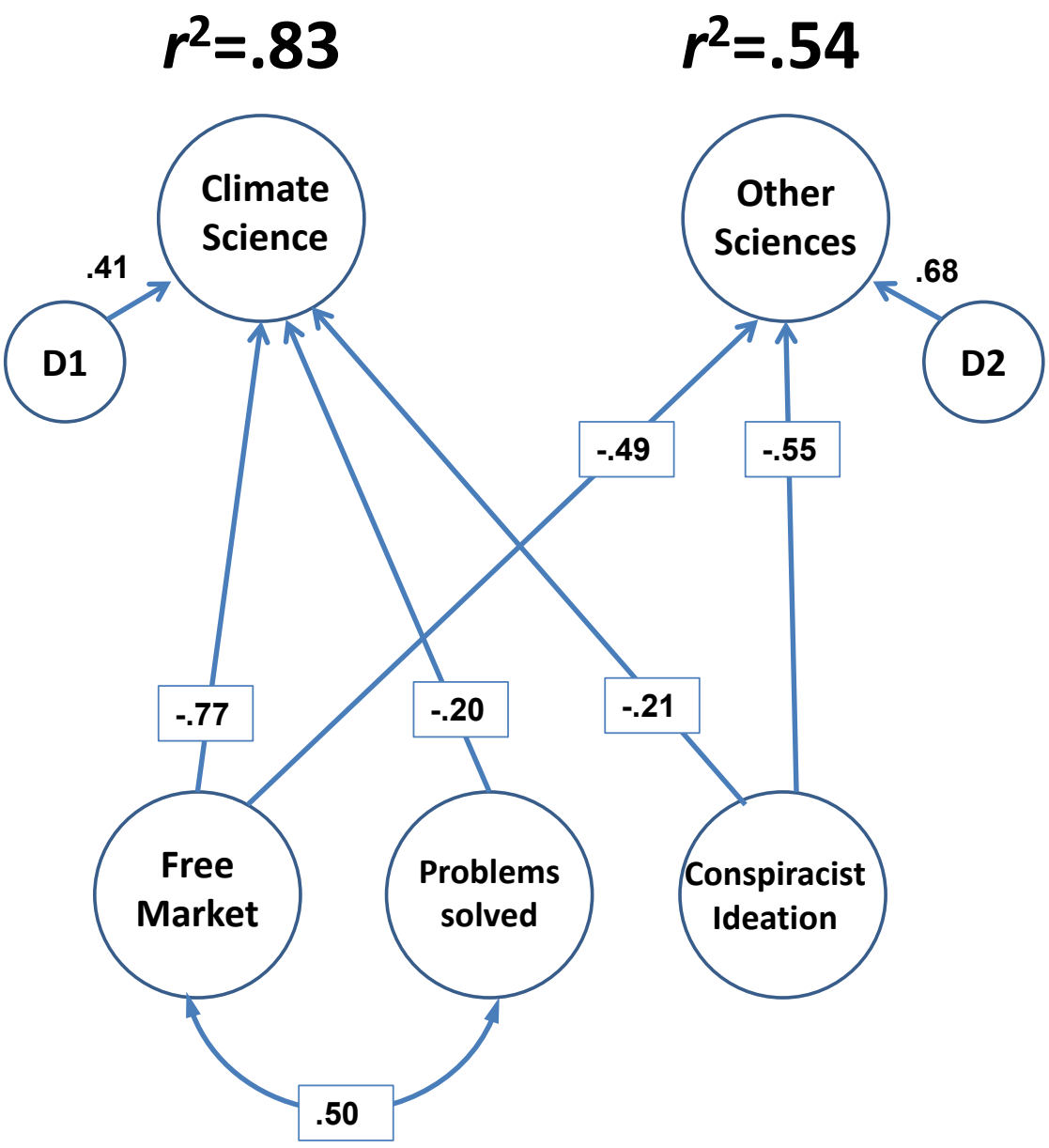
[6] Responses to the remaining items were numbers in the range of 0 to 100 and were used for the model in Figure 1.

Figure Captions

Figure 1. Latent variable model for the relationship between perceived consensus among scientists and acceptance of scientific propositions. All correlations and loadings are significant and standardized. Manifest variable labels are explained in Table 2. See text for further explanation.

Figure 2. Latent variable model that predicts acceptance of climate science and acceptance of other scientific propositions on the basis of free-market ideology, the perception that earlier environmental problems have been solved, and conspiracist ideation. All regression weights and correlations are significant and standardized. Weights and correlations that are not shown were set to zero (e.g., correlation between the residuals of climate science and other science). Manifest variables for each latent variable and their loadings are provided in Table 2. See text for further explanation.


.43
Consensus
Science
.84
.79
.55
.72
.89
.86
HIV$_c$
LC$_c$
AGW$_c$
AGW$_b$
LC$_b$
HIV$_b$
e3
e2
e1
e6
e5
e4
.88
.62
.67


r^2=.83
r^2=.54
Climate Science
Other Sciences
.41
.68
D1
D2
-.49
-.55
-.77
-.20
-.21
Free Market
Problems solved
Conspiracist Ideation
.50